DIRECT TESTIMONY ON REHEARING OF CHRISTOPHER J. BOYER
ON BEHALF OF AMERITECH ILLINOIS
DOCKET NO. 00-0393

I. BACKGROUND

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Christopher J. Boyer. My business address is Three Bell Plaza, Dallas, Texas 75202.

Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?

A. I am employed by SBC Management Services Inc., a subsidiary of SBC Communications Inc. ("SBC"). My position is General Manager - Network Regulatory for SBC's incumbent local exchange carriers ("ILECs").

Q. WHAT ARE YOUR RESPONSIBILITIES?

A. My current responsibilities include representing the planning, engineering, and operations of SBC's ILEC networks, including those of Ameritech Illinois, before federal and state regulatory bodies. In particular, my current responsibilities include such representation for Project Pronto.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I have a Bachelor of Science - Business Administration degree from the University of Kansas in Lawrence, Kansas. Additionally, I have a Master's of Business Administration degree in Finance from the University of Houston in Houston, TX. I have also completed internal company training related to telecommunications networks and special services provisioning, maintenance and repair.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE.

A. From 1993 through 1998 I held various positions responsible for customer service and special services circuit provisioning and maintenance within Southwestern Bell Telephone Company ("SWBT"). In late 1998 I assumed local wholesale product management responsibilities for Frame Relay, Asynchronous Transfer Mode ("ATM") and Broadband Services for the SBC ILECs. I assumed my current responsibilities in December of 2000.

Q. WHAT PART OF YOUR WORK EXPERIENCE QUALIFIES YOU TO REPRESENT PROJECT PRONTO?

A. In my previous product management position, I was responsible for the development of the SBC Broadband Service offering to CLECs over the Project Pronto network architecture. This responsibility included leading an inter-disciplinary team within SBC, including the various network organizations responsible for the deployment, service provisioning, and maintenance of the Project Pronto architecture. Additionally, on behalf of SBC's ILECs, I hosted CLEC collaborative sessions and Broadband Service trials for the purpose of discussing regulatory, network/technical and product specific issues associated with the SBC ILECs' Broadband Service product and the Project Pronto network architecture.

Q. HAVE YOU PREVIOUSLY FILED ANY DOCUMENT IN THIS PROCEEDING?

A. I filed an affidavit in connection with Ameritech Illinois' application for rehearing in this proceeding.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to address the Project Pronto issues included in this rehearing. Specifically, I will address the technical feasibility and appropriateness of "unbundling" the Project Pronto network architecture and address several questions raised by

Commissioner Squires. My testimony will outline the Project Pronto network architecture, outline SBC's current product offering to CLECs where the Project Pronto architecture is deployed, discuss why this architecture should not be "unbundled" as a general matter, and address the technical feasibility of the new UNEs proposed by the Commission.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. My testimony:

- Describes the Project Pronto network architecture and how it expands the availability of ADSL services to consumers and small businesses residing beyond the traditional barrier of ADSL availability.

- Describes the SBC Broadband Service, SBC's wholesale offering to CLECs over the Project Pronto architecture where deployed. This service provides CLECs the capability to establish an ADSL service over the Project Pronto network architecture at cost-based rates. The Broadband Service gives CLECs an additional competitive option on top of other currently available offerings (such as copper-based line sharing, access to dark fiber and/or unbundled subloops) and will not take away any other options available to CLECs today nor impact a CLEC's ability to line share using traditional copper facilities.

- Discusses why the Project Pronto architecture should not be unbundled as a general matter because Project Pronto is primarily "packet switching" from the remote terminal site to the central office and does not meet the factual criteria set forth by the FCC that would require an ILEC to unbundle packet switching. This section also discusses how the various Project Pronto components interwork with one another and why "unbundling" of individual components is therefore not feasible.

- Addresses technical issues related to each of the new "UNEs" established by the Commission in this case and explains why such new "UNEs" are either not technically feasible and/or impractical to provide.

- Discusses why "collocation" of CLEC line cards in Project Pronto equipment is unnecessary (in light of SBC's collaborative commitment sin the FCC's Project Pronto Order) and inconsistent with the FCC's established approach to collocation requirements.

- Answers questions 1(A), 2, 3(A)(i), 5, 6(A) and (C), and 8(A) and (B) posed by Commissioner Squires.

III. DESCRIPTION OF THE PROJECT PRONTO ARCHITECTURE

Q. WHAT IS PROJECT PRONTO?

A. SBC's Project Pronto initiative consists of an investment of over $6 billion to, among other things, rapidly expand the availability of high-speed Internet access (and other services (called advanced telecommunications services or broadband services) to millions of Americans that would otherwise not have the alternative of Digital Subscriber Line ("DSL") broadband service today.

Q. WHAT IS DSL SERVICE?

A. DSL technology permits the transmission of data over an existing copper loop at significantly higher speeds than can be achieved by current "dial-up" analog data transmission systems and traditional circuit-switched network systems. DSL service comes in many different "flavors." Thus, one often sees references to xDSL service, where the x is a variable that can be changed to indicate the particular flavor of DSL service. For example, ADSL refers to Asymmetric DSL service, which is "asymmetric" because it provides much faster transport of

data downstream to the end-user than upstream away from the end-user. ADSL is generally viewed as the best type of ADSL for high-speed Internet access in the mass market, because end-users are more interested in getting quick downloads and responses from the Internet than in sending out data themselves. SDSL, or Symmetric DSL, by contrast, would carry data traffic at the same speed both upstream and downstream.

Q. WHICH FORMS OF DSL SERVICE ARE CAPABLE OF LINE SHARING?

A. At the present time the only forms of DSL service that are capable of being line shared (e.g. placed on the same facility as the voice service to an end user) are ADSL, Rate Adapative DSL (RADSL) and G.Lite. The FCC recognized this in its Line Sharing Order (CC Dockets 98-147 and 96-98, FCC 99-355, released Dec. 9, 1999) when it found that "We require incumbent LECs to provide unbundled access to the high frequency portion of the loop to any carrier that seeks to deploy any version of xDSL that is presumed to be acceptable for shared-line deployment in accordance with our rules. xDSL technologies that meet this presumption include ADSL, as well as Rate-Adaptive DSL and Multiple Virtual Lines (MVL) transmission systems, all of which reserve the voiceband frequency range for non-DSL traffic."[1]

Q. HOW WOULD PROJECT PRONTO MAKE DSL SERVICE AVAILABLE TO MORE CUSTOMERS?

A. Most forms of xDSL service are limited to copper loops that are less than 17,500 or 18,000 feet long (18 kft).[2] Loops of less than 18 kft can be used to provide DSL service if they are connected to a Digital Subscriber Line Access Multiplexer ("DSLAM"), which provides packet switching functionality needed for DSL service. Project Pronto involves the

[1] FCC Line Sharing Order at para. 71.

[2] ADSL, Rate Adaptive DSL ("RADSL") and most other forms of DSL are limited to 18 Kft copper loops. IDSL can be used to provide service to customers residing beyond the traditional 18 kft barrier using all copper loops – however IDSL is lower grade version of DSL limited to 144 Kbps transmission.

placement of fiber transmission facilities and remote terminals ("RTs") containing Next Generation Digital Loop Carrier ("NGDLC") equipment that effectively moves the DSLAM functionality out of the central office much closer to the end user location. This effectively shortens the copper portion of the loop and thus makes DSL capability available to end users that reside beyond the traditional 18 kft barrier. This will substantially expand the availability of DSL service to the mass market.

Q. WHAT COMPONENTS MAKE UP THE PROJECT PRONTO ARCHITECTURE?

A. Generally speaking, the only portion of the existing network that would be used with the Project Pronto overlay network is the copper subloop from the end-user's premise to the Serving Area Interface ("SAI"), which is a cross-connect box used to connect copper feeder and distribution pairs. The new Project Pronto architecture thus consists of the following network components:

- Copper feeder pairs between an SAI and a Project Pronto RT;
- An NGDLC in the RT, which is used for both voice (i.e., POTS) and data (i.e., DSL) services;
- Separate fiber transport facilities for voice and data between each RT and its central office (specifically, an OC-3 facility for voice and an OC-3c for data);
- Optical concentration devices ("OCDs") in the central offices, used for data; and
- NGDLC central office terminals ("COTs"), used for voice.

Q. HOW DO THESE COMPONENTS INTERACT TO PROVIDE DSL SERVICE?

A. Schedule CJB-1 to my testimony outlines the interworking of the Project Pronto architecture to create an end-to-end DSL service. At a high level, the standard copper phone line is used to carry both voice and data from the end user customer premises to a Project Pronto RT site.

Within the RT site, the copper facility from the customer premises terminates on the backplane of the NGDLC equipment. In the case of Project Pronto, this NGDLC will predominantly be the Alcatel Litespan 2000 system. A standard configuration of the Litespan 2000 equipment being deployed in SBC's network is further explained in Schedule CJB-2 to my testimony.

Within the NGDLC system, each end user line terminates on a line card placed within a slot in one of the Channel Bank Assemblies (CBA, or Channel Bank) in the system. The line card, along with the common control cards and software in the NGDLC system, enables the DSL service functionality. Schedule CJB-3 to my testimony illustrates a typical line card placed within the NGDLC architecture. At a high level, the NGDLC system, including the line card, splits the voice and data signal and provides for the voice traffic and the data traffic to be transported over separate fiber-based transport facilities to the central office. The DSL traffic (i.e., the data) is routed over a packet switched Asynchronous Transfer Mode ("ATM")-based OC-3c facility. The voice traffic is routed over a traditional SONET Time Division Multiplexed ("TDM") OC-3 facility.

Within the central office, the data OC-3c terminates in a device called the Optical Concentration Device ("OCD"). The OCD is an ATM packet switch that provides the capability to aggregate DSL traffic to the appropriate CLEC. Specifically, the data traffic would be transferred to the CLEC's equipment collocated in the central office via a port on the OCD. The voice OC-3 facility terminates on the central office terminal (COT). From the COT, the voice traffic may be routed directly to Ameritech Illinois' local voice switch in order to provide dial tone to the end user customer premises, or in cases where a CLEC provides the voice service as well as the DSL service, the voice traffic can be delivered to the Main Distribution Frame ("MDF") in order to be extended to a CLEC collocation area.

Q. WHICH OF THE PROJECT PRONTO COMPONENTS OUTLINED ABOVE ARE NEW COMPONENTS BEING PLACED WITHIN SBC'S NETWORK?

A. Project Pronto involves the placement of new RTs equipped with NGDLC systems and the upgrading of existing RT sites. In the case of a new RT site, all of the components mentioned above would require new capital investment by SBC. In the case of an upgrade of an existing RT site, although the NGDLC itself and associated fiber and copper facilities would be in place, new common control cards, line cards and associated software would have to be activated within the RT site to enable the DSL capability.

Regardless of whether the RT in question is a new one or an upgraded one, a new OCD device in the central office would be required to provide data connectivity to the provider of DSL service (e.g., the CLEC). An OCD is a new piece of equipment being deployed by SBC for the sole purpose of providing multiple CLECs (including SBC's data affiliate) with access to the Project Pronto network architecture. In either scenario outlined above, the NGDLC systems (whether new or upgraded), OCDs, fiber and copper facilities, cards, software and associated systems constitute significant additional capital investment on the part of SBC. As noted in the Direct Testimony of Mr. James E. Keown, under its original planned deployment, Ameritech Illinois would have invested nearly $519 million in capital to deploy these components throughout Illinois.

Q. WHAT FLAVORS OF DSL SERVICE COULD BE PROVIDED OVER THE PROJECT PRONTO ARCHITECTURE AS IT WAS PLANNED FOR DEPLOYMENT IN ILLINOIS?

A. As I noted, Ameritech Illinois would have deployed primarily the Alcatel Litespan 2000 system as part of Project Pronto in Illinois. At present, the ATM packet-switched portion of this system uses line cards that support ADSL service only.[3]

Q. PLEASE EXPLAIN.

A. There are several reasons for this. First, SBC has always viewed Project Pronto as a means to extend broadband high-speed Internet access capability to the "mass market" (i.e., residential and small business customers), a segment of the public historically unable to obtain broadband services. Second, the bandwidth preferred for high-speed Internet access is generally asymmetric (meaning end users require large amounts of bandwidth downstream toward the end-user for downloading and smaller bandwidth upstream toward the Internet for uploading). It is widely accepted within the industry that ADSL is best form of xDSL to provide high-speed Internet access at reasonable cost. In contrast, medium to large business customers generally have had access to high-speed capabilities for many years. Third, end users often do not want to have to pay for a separate line just for Internet access. Similarly, many CLECs want to use the existing POTS (i.e., voice) line into an end user's premises to be able to offer DSL service in a quicker and more cost effective manner. Thus, both end users and CLECs would prefer a form of DSL that works well on a loop that is also being used to provide voice service. ADSL is the form of DSL that provides the best match for these three criteria.[4] Furthermore, the manufacturers of NGDLCs are aware of these market

[3] It is possible to place 'line cards" supporting some forms of xDSL in the traditional POTS portion of the Litespan, such as an HDSL and/or IDSL line card. HDSL is used to provide a comparable service to a T1 and as such if a CLEC requested a T1 from Ameritech Illinois, Ameritech Illinois may elect to use this line card to deliver a T1 equivalent service to the CLEC. This issue is not a point of contention in this case as CLECs are already provided the capability to provision this service with Ameritech Illinois' existing product offerings. Further, IDSL as explained above is a lower grade quality DSL service than has typically been discussed in the context of this case.

[4] The FCC recognized this fact as well in the Line Sharing Order when it stated "ADSL is the most widely deployed version of xDSL that is currently presumed acceptable for deployment on a shared line." FCC Line Sharing Order at para. 71.

preferences, which explains why ADSL technology is more readily available in NGDLC equipment than the other forms of DSL.[5]

Q. WILL SBC DEPLOY OTHER TYPES OF xDSL IF THEY BECOME AVAILABLE FROM THE VENDOR OF SBC'S PROJECT PRONTO EQUIPMENT?

A. Should the vendors of SBC's NGDLC equipment make available additional line cards and software capability in the future, SBC has committed in the FCC Project Pronto Order (FCC 00-336) to host an industry-wide collaborative to discuss with CLECs the development and deployment of such future features and functions over the Project Pronto equipment. In fact, SBC stated in its commitments attached to the FCC order that, subject to various factors, the "SBC/Ameritech incumbent LECs will approach such discussions from the presumption that it seeks to optimize the use of their network by affiliated and unaffiliated carriers and support the development of new xDSL features and functions."[6]

Q. WHAT FACTORS IN THE SBC COMMITMENTS WOULD BE CONSIDERED IN SBC's DECISION TO DEPLOY OR NOT DEPLOY ANY ADDITIONAL FEATURE OR FUNCTION AS IT BECOMES AVAILABLE FROM THE VENDOR OF SBC's PROJECT PRONTO EQUIPMENT?

A. The SBC commitments state that "During such collaborative sessions the following types of issues will be addressed regarding features and functions that are requested to be deployed by the SBC/Ameritech incumbent LECs: technical and operational feasibility, commercial arrangements pertinent to the deployment of such features and functions and how those costs (e.g., costs of procuring, developing, provisioning, deploying and maintaining such features and functions) will be recovered, whether technical, operations support systems and operational trials will be needed and how they will be conducted, and whether such features

[5] As of this date, Alcatel, the manufacturer of the Litespan 2000 system which constitutes the majority of SBC's Project Pronto deployment, only manufactures ADSL-capable line cards. No other line cards, such as an SDSL line card, are available at this time.

[6] FCC Project Pronto Order (00-336) page 42, SBC Commitments.

and functions will reduce the capacity of remote terminals to meet the forecasted demand for advanced services and POTS."[7]

Q. DID THE FCC FIND THIS PROCESS ADEQUATE TO ADDRESS CLEC CONCERNS THAT SBC DEPLOY FUTURE FEATURES AND FUNCTIONS AS THEY BECOME AVAILABLE OVER THE PROJECT PRONTO NETWORK ARCHITECTURE?

A. Yes. The FCC stated in its Project Pronto Order that "We find that the collaborative session process in SBC's proposal adequately addresses the requests of AT&T, DATA, and others concerning the on-going development of new services and the risk that SBC's incumbent LECs will discriminate in favor of their chosen technology."[8]

Q. DID THE FCC ACKNOWLEDGE THE EXISTENCE OF THE NETWORK CAPACITY AND TECHNICAL CONCERNS RELATED TO THE DEPLOYMENT OF ADDITIONAL FEATURES AND FUNCTIONS AS MENTIONED ABOVE AND FURTHER OUTLINED LATER IN THIS TESTIMONY?

A. Yes. The FCC stated that "We recognize that making available the full features, functions, and capabilities of the equipment may require SBC to resolve unforeseen technical and operational issues. Moreover, we understand that there may be capacity issues, in that potentially competitors may seek features that would use much of the available bandwidth of a particular feeder line."[9]

Q. CAN YOU BRIEFLY DESCRIBE THE POTENTIAL CAPACITY IMPACT CREATED BY OFFERING SERVICES OTHER THAN ADSL IF THEY BECOME AVAILABLE FROM SBC's PROJECT PRONTO VENDORS?

A. Yes. Consider the situation in which a CLEC wanted to deploy an SDSL service in a given RT site (if such a capability were made available by SBC's vendors in the future). SDSL is typically used to provision data transport services to small to medium businesses, typically at higher rates of speed than is usually allocated for consumer Internet access. However, in

[7] SBC Commitments (Attached to Project Pronto Order), page 42 Section 8, Second Paragraph.
[8] FCC Project Pronto Order at 43.

order to provide an effective business class SDSL service most providers require a Constant Bit Rate ("CBR") quality of service, in contrast to consumer high-speed Internet access which typically is allocated bandwidth with an Unspecified Bit Rate ("UBR)" quality of service. The difference between UBR and CBR is that while with CBR an end user is dedicated (guaranteed) at all times a fixed, constant amount of bandwidth, a UBR customer is only provided the available amount of bandwidth when they access the Internet.

For example, whereas a business, in order to transport large amounts of data on a real time basis, may need a constant, guaranteed connection at various speeds, a consumer, because they will only be on line and downloading and/or uploading to the internet at specific points in time typically does not need such a connection. The Pronto network is designed to support consumer, high-speed Internet access for the mass market and thus is focused on a UBR type of offering. In contrast, offering CBR services at high speeds creates a significant, adverse affect on the overall capacity of the Pronto network architecture, as is further illustrated in Schedule CJB-8 to my testimony.

Q. WOULD DEPLOYMENT OF THE PROJECT PRONTO DSL ARCHITECTURE IN ILLINOIS LIMIT THE AVAILABILITY OF THE UNBUNDLED NETWORK ELEMENTS THAT ARE AVAILABLE TO CLECS TODAY?

A. No. The Project Pronto deployment is an "overlay" network. This means that the Pronto deployment will not remove existing copper facilities. Rather, Project Pronto adds entirely new equipment to the existing copper loops in SBC's network. Due to the overlay nature of the Project Pronto deployment, CLECs would continue to have all of the competitive options that are available to them today. In fact, Project Pronto only serves to expand the options available to CLECs to provision ADSL service to end users.

[9] Id. at 44.

Q. PLEASE DESCRIBE SOME OF THE COMPETITIVE OPTIONS AVAILABLE TO CLECS TO PROVIDE DSL SERVICE EVEN IF PROJECT PRONTO WERE NEVER DEPLOYED.

A. Lacking the Project Pronto deployment, a CLEC could provide xDSL service to customers residing beyond the 18 kft barrier by placing a DSLAM in the field. Such equipment could be placed within an existing SBC structure (such as an RT site where collocation space was available) and/or in a separate CLEC structure. In addition to the physical equipment, the CLEC could also obtain access to fiber-based transport from this structure back to their collocation arrangement within the serving wire center in several different ways: (1) by leasing Ameritech Illinois-provided dark fiber and/or optical sub-loops; or (2) by deploying their own fiber optic facilities for such purpose or (3) by purchasing such fiber and/or transport from a third party provider. Additionally, a CLEC could also obtain access to copper sub-loops from the location of this structure to the end user location by accessing such sub-loops at the Feeder Distribution Interface ("FDI") or Serving Area Interface ("SAI") and/or by requesting Ameritech Illinois to construct an Engineering Controlled Splice ("ECS"). CLEC access to sub-loops subtending an RT location is more fully explained in the Direct Testimony of Mr. Mark Welch. All of these options would remain available to CLECs regardless of SBC's Project Pronto deployment.

IV. THE SBC BROADBAND SERVICE

Q. PLEASE DESCRIBE SBC's BROADBAND SERVICE OFFERING.

A. SBC's Project Pronto deployment proceeded following extensive proceedings at the FCC to ensure that access to this architecture was offered in a pro-competitive manner and that the regulatory ground rules for Project Pronto were clear. One of the commitments made by SBC was that "the SBC/Ameritech incumbent LECs will offer all telecommunications carriers, including their separate Advanced Services affiliate(s), nondiscriminatory access to a

combined wholesale broadband service where the SBC/Ameritech incumbent LEC deploys a NGDLC architecture that supports both POTS and xDSL services." Furthermore, SBC committed that "SBC's incumbent LECs will offer to all telecommunications carriers, including their separate Advanced Services Affiliates, a combined voice and data service offering where the SBC/Ameritech incumbent LEC deploys a NGDLC architecture that supports both POTS and xDSL services."[10]

In locations where Project Pronto DSL facilities are deployed, consistent with these commitments, SBC is offering the Broadband Service product offering on a non-discriminatory basis to all CLECs, including SBC's advanced services affiliates. Where deployed, the Broadband Service is a new offering that is being made available in addition to all of the options currently available to CLECs.

Q. WHAT VARIATIONS OF THE WHOLESALE BROADBAND SERVICE ARE AVAILABLE TO CLECS?

A. The Broadband Service consists of two distinct service configurations being made available to CLECs. The first service configuration provides CLECs the capability to provision an ADSL service to an end user customer premises over the Project Pronto network architecture. The second service configuration provides CLECs the capability to provision both a voice and data (e.g. ADSL) service over the same network infrastructure. CLECs are required to be collocated in the serving central office in order to receive either of these service configurations.

Q. HOW IS A STANDARD ADSL OFFERING PROVISIONED USING THIS WHOLESALE BROADBAND SERVICE?

[10] FCC Project Pronto Order (00-336), pages 34-35

A. Schedule CJB-4 illustrates in detail the provision of an ADSL service over the Project Pronto network architecture. At a high level, the Broadband Service provides CLECs the capability to establish an end-to-end ADSL service that involves the use of copper facilities from the end user customer premises to the RT site, the use of the packet switched ATM transport facility (OC-3c) from the RT site to the central office OCD in the form of a Permanent Virtual Circuit ("PVC") and the use of the OCD itself in order to aggregate traffic to the appropriate CLEC.

Q. HOW IS THE COMBINED VOICE AND DATA ARRANGEMENT MENTIONED ABOVE PROVISIONED?

A. Schedule CJB-5 illustrates in detail the Combined Voice and Data service offering. At a high level, the combined voice and data service configuration provides CLECs the same options as made available for the provision of the data path. However, this configuration also provides CLECs the capability to provision a voice path from the RT site, through the COT and delivered to the appropriate CLEC's collocation arrangement in the central office via the Main Distribution Frame ("MDF"). From the MDF the voice service is subsequently delivered to a CLEC collocation arrangement in a like manner to an existing unbundled local loop.

Q. YOU MENTIONED ABOVE THAT WITH THE SBC BROADBAND SERVICE DATA TRANSPORT FROM THE RT TO THE CENTRAL OFFICE OCD IS PROVIDED TO CLECS IN THE FORM OF A PERMANENT VIRTUAL CIRCUIT ("PVC"). WHAT IS A PVC?

A. A PVC is a permanent virtual circuit provided within the ATM bitstream from the NGDLC to the central office OCD. Basically, a PVC is the packet representation of the data from an individual end user DSL service within the ATM portion of the network. This differs from traditional time division multiplexed ("TDM") technology in that, because this path is virtual, the path is not always dedicated for that end user's use.

Q. PLEASE EXPLAIN.

A. In the traditional TDM voice network, an individual line is assigned to a specific channel within a higher level transport facility. For example, in the case of a T1 there are 24 available channels. When an end user goes off-hook at their premises, that individual's voice transmission is assigned to one of the 24 available channels on that T1. As long as that call is in progress, that specific end user occupies that physical channel on the T1 until the call is completed.

In contrast, in an ATM network the individual end user's transmission is not provided a constant channel within the higher level facility. Each piece of information from an end user is converted into "packets" which are then placed across the transport facility. For example, in the case of the Project Pronto architecture, because the data traffic is "packetized" at the RT site, the data traffic from each end user is broken into "packets" which are then routed to the central office OCD over the same transport facility (in this case the OC-3c). These packets are transported over the OC-3c on a real time basis – meaning that the packets are transported over the OC-3c when they are established (e.g. when an individual is downloading or uploading to/from the Internet) and if such an event is not in process, the individual end user's line does not occupy any portion of the physical facility. This is in direct contrast to a TDM-based network in which when an end user is online their line occupies a portion of the available bandwidth (in the form of a channel as represented above) regardless of whether that individual is downloading or uploading at that moment in time.

A practical example of this is the Internet. With a traditional TDM (voice) network, when an end user goes online, their individual line is utilizing one channel of a higher level facility the entire time they are online (whether that individual is transmitting data or simply reading

information downloaded from the Internet). The difference with an ATM packet-switched network is that instead of occupying a constant channel throughout the call, when an end user is not transmitting or receiving (for example reading content), their line does not occupy any bandwidth within the transport facility. The advantage of this arrangement is that many more end users can be served using a transport facility than would otherwise be capable given traditional TDM-based transport.

This higher utilization of transport facilities is the key to making high-speed Internet access economic to provide to mass market consumers. Instead of dedicating bandwidth (such as 1.544 Mbps) as guaranteed channels on a higher level facility, the ATM network allows SBC to "oversubscribe" those facilities and thus provide service to many more end users than would otherwise be possible. This oversubscription provides SBC the capability to share the costs of this facility amongst more end users and in theory serves to make high-speed Internet service more affordable. In contrast, as is pointed out in my discussion of CBR offerings above, any dedication of bandwidth to an individual end user serves to reduce this capacity to a large degree – potentially limiting not only the number of customers that the Pronto network architecture can serve, but also reducing the quality of service end users will receive and potentially leading to increased costs as the facility costs are shared among fewer potential subscribers.

Q. HOW DOES THIS RELATE TO THE PVC?

A. The PVC is the "virtual circuit" that is established within the ATM portion of the network. As mentioned above, the PVC represents the end user's virtual path through the ATM network.

Q. HOW WOULD AMERITECH ILLINOIS' WHOLESALE BROADBAND SERVICE PROVIDE CLECs WITH AN ADDITIONAL, VIABLE OPTION TO LINE SHARING?

A. As stated above, the use of the copper facilities from the end user location to the RT site is provided in both a dedicated data version and a "line shared" version. With this line-shared version, the net result is that an end user is able to receive both POTS and DSL service over the same copper distribution pair, and that a CLEC may provide this DSL service while Ameritech Illinois provides the POTS. Therefore, this Broadband Service arrangement achieves the same functional result as the line sharing defined by the FCC's Line Sharing Order.

Q. HOW DOES THE BROADBAND SERVICE COMPARE TO FCC-REQUIRED "LINE SHARING" THROUGH THE HFPL (HIGH FREQUENCY PORTION OF THE LOOP) UNE?

A. They are very different from a technical and operational perspective, but essentially the same in terms of facilitating advanced services competition. As defined by the FCC in its Line Sharing Order, and the resulting FCC regulations regarding the HFPL UNE, "line sharing" is the ability for the CLEC's high-frequency DSL signal to occupy (i.e., share) the same physical copper facility (i.e., loop) that is used for the incumbent LEC's low-frequency POTS signal. (See 47 C.F.R. § 51.319(h)(1-2) and (6)). Although the Broadband Service mentioned above achieves the same functional result as line sharing (i.e., provides voice and data service to an end user on the same copper loop from the RT to the customer premises), and thus serves the same pro-competitive goal, the end-to-end Broadband Service arrangement does not meet the FCC's definition of the HFPL UNE. Specifically, with the wholesale Broadband Service the DSL and POTS signals do not share a copper facility within the NGDLC equipment, or through the fiber optic transport back to the central office, or within the OCD in the central office. Rather, as described above, the voice and data signals

are split at the RT and travel over entirely separate facilities to different points in the serving central office. Therefore, this Broadband Service arrangement is not a form of the HFPL UNE required in the Line Sharing Order.

Q. DO THE PROJECT PRONTO ARCHITECTURE AND THE WHOLESALE BROADBAND SERVICE PREVENT CLECS FROM LINE SHARING AS DEFINED BY THE FCC?

A. No. The line sharing defined by the FCC involves Ameritech Illinois' copper loops and subloops. As I explained above, because Project Pronto is an overlay network architecture, it does not displace Ameritech Illinois' existing copper loops and sub-loops. On the contrary, as I noted above, Ameritech Illinois' wholesale broadband service provides CLECs with an additional means of providing DSL service to end-users.

V. COMMISSION CONCLUSIONS REGARDING PROJECT PRONTO

Q. IN ITS ORDER IN THIS CASE THE COMMISSION CONCLUDED THAT "IT IS TECHNICALLY FEASIBLE TO PROVIDE PROJECT PRONTO AS UNES." PLEASE RESPOND.

A. "Unbundling" the Pronto DSL architecture into piece parts would create many problems of feasibility and practicality. The FCC recognized in the First Report and Order that "legitimate threats to network reliability and security must be considered in evaluating the technical feasibility of interconnection or access to incumbent LEC networks. Negative network reliability effects are necessarily contrary to a finding of technical feasibility. Each carrier must be able to retain responsibility for the management, control, and performance of its own network."[11] The network capacity impacts and inefficiency created by the Commission's Order in this case have created a scenario within which Ameritech Illinois can no longer effectively manage its Project Pronto network architecture, as explained in detail in the testimony of Mr. Ireland, Mr. Keown, Mr. Hamilton and others.

I will attempt to explain why it is not only inappropriate to require the unbundling of the Project Pronto architecture as a matter of policy but it is also not technically feasible in many instances and/or creates significant capacity impacts that would make the Project Pronto deployment uneconomical, as addressed in the Direct Testimony of Mr. Ross Ireland and other witnesses. I will address the appropriateness and technical feasibility of each of the specific new "UNEs" described in the Order in the following sections of my testimony.

Q. WHAT NEW "UNEs" DID THE COMMISSION'S ORDER REQUIRE?

A. The Commission concluded the following: "The Commission hereby requires Ameritech Illinois to make available to competitive providers nondiscriminatory access, at just and reasonable rates, to Project Pronto UNEs as follows:

a. Lit Fiber Subloops between the RT and the OCD in the CO consisting of one or more PVPs ("permanent virtual paths") and/or one or more PVCs ("permanent virtual circuits") at the option of CLEC;

b. Copper Subloops consisting of the following segments:

i. The copper subloop from the RT to the NID at the customer premises;

ii. The copper subloop from the RT to the SAI ("serving area interface");

iii. The copper subloop from the SAI to the NID at the customer premises.

c. ADLU line cards owned by the CLEC and collocated in the NGDLC equipment at the RT;

d. ADLU line cards owned by the ILEC in the NGDLC equipment in the RT;

e. A port on the OCD in the CO; and

[11] FCC First Report and Order (CC Docket 96-98, released Aug. 8, 1996), para. 203

f. Any combination thereof, including the line shared xDSL loop from the OCD port to the NID." [12]

VI. GENERAL UNBUNDLING OF PROJECT PRONTO

Q. WHY SHOULDN'T AMERITECH ILLINOIS BE REQUIRED TO "UNBUNDLE" PROJECT PRONTO AND/OR THE ASSOCIATED WHOLESALE BROADBAND SERVICE?

A. They are at least three reasons. First, the Project Pronto network architecture cannot be unbundled because of the manner in which the components of the architecture interwork. Second, the Project Pronto architecture includes components that fit the FCC's definition of packet switching functionality, which the FCC declined to unbundle as a general matter in its UNE Remand Order, except in limited circumstances that do not apply to Ameritech Illinois. Finally, even if the FCC had not already spoken conclusively on the issue, it is my understanding (as a non-lawyer) that any state directive to unbundle the Project Pronto architecture or the associated Broadband Service would have to be supported by an analysis that satisfies the "necessary" and "impair" standards required by the Act for such unbundling.

Q. YOU SAID THAT THE PRONTO DSL ARCHITECTURE CANNOT BE "UNBUNDLED" BECAUSE OF THE WAY IN WHICH THE COMPONENTS INTERWORK. PLEASE EXPLAIN.

A. My point is that the components of the Pronto DSL architecture interconnect and interwork with one another in an interdependent, integrated fashion, so that allowing a CLEC to assert control over any one piece of the architecture and demand "access" to that piece – as with a traditional UNE – would prevent the architecture from performing its interdependent, integrated function.

Q. CAN YOU GIVE AN EXAMPLE?

[12] See ICC Order 00-393

A. Yes. As mentioned previously, in the Pronto architecture the end user's DSL service becomes "packetized" at the RT site by the NGDLC equipment. From that point forward, the DSL service is provisioned via the packet-switched network. Therefore, lacking the complete packet switched portion of the network (e.g. the OCD working in conjunction with the NGDLC) there would be no means to provide any form of DSL service. Further, because the physical copper facilities are spliced ("hardwired") to the backplane of the NGDLC RT, those facilities must be used in conjunction with the NGDLC to provide connectivity from the RT site to the end user customer premises. It is not technically feasible to access any of these components as discrete, stand-alone elements given SBC's planned Project Pronto deployment. As a consequence, Ameritech Illinois instead would offer the CLECs an end-to-end wholesale Broadband Service, from the end user's premises to Ameritech Illinois' central office, for incorporation into the CLECs' own DSL services for their individualend users.

Q. HOW DOES THE END-TO-END BROADBAND SERVICE PROVIDED OVER THE PROJECT PRONTO ARCHITECTURE COMPARE TO UNEs IN AMERITECH ILLINOIS' NETWORK?

A. The primary difference between the Broadband Service offering and other traditional UNEs is that with the Project Pronto network architecture and the Broadband Service a single, individual end user line does not occupy a constant path throughout the end-to-end Project Pronto architecture. Consider UNEs such as unbundled dedicated transport ("UDT") and unbundled high-capacity loops. Each of these UNEs represents and provides the CLEC with a specific and constant amount of total bandwidth within the ILEC's underlying facility (e.g., a SONET transport facility). In addition, each of these UNEs is accessible at both end-points of the UNE with the same interface specifications (i.e., bandwidth, signal characteristics, and physical connection). Ameritech Illinois' end-to-end wholesale Broadband Service does neither of these things.

Q. CAN YOU PROVIDE AN EXAMPLE?

A. Yes. A DS-3 UDT UNE occupies a fixed piece of bandwidth (approximately 45 Mbps) within a higher-bandwidth, underlying transport facility. In some instances, this UNE may traverse more than one such facility connected in tandem between the two end-points of the UNE. The bandwidth of this UDT is constant throughout the entire length of the UNE. In addition, the UDT's bandwidth occupies an unchanging position within the digital multiplexing hierarchy of an underlying transport facility. This UDT is also accessible at each end with the same DS-3 bandwidth, same electrical signal characteristics, and same physical coaxial connection.

Q. HOW DO THE VIRTUAL CIRCUITS ESTABLISHED WITHIN THE END-TO-END WHOLESALE BROADBAND SERVICE DIFFER FROM THE UDT DESCRIBED ABOVE?

A. Unlike the UDT described in the paragraph above, the virtual circuits established for DSL services through the Project Pronto NGDLC RT, OC-3c data transport fibers, and OCD do not occupy a specific and fixed piece of bandwidth. In other words, while these virtual circuits do share the same Project Pronto equipment and transport facility, they do so only in a statistical (i.e., variable) manner, not as specific, fixed amounts of bandwidth for each virtual circuit. Therefore, various CLECs' end user circuits literally share the very same bandwidth in the Project Pronto architecture.

In addition, these virtual circuits do not have the same interface characteristics at each end. At one end, the virtual circuit for one DSL end user can only be physically accessed as a two-wire metallic DSL-formatted interface that connects to the copper pair extending to that end user's premises. At the other end, the virtual circuit for that same end user exists only within the ATM-formatted high-bandwidth signal delivered to a port on the OCD, which contains

not one but many virtual circuits for different end users' DSL services. In contrast, as described above, UDT can be accessed on a circuit-by-circuit basis with the same bandwidth and interface specifications at both ends. Therefore, the dissimilar interfaces at the ends of the Project Pronto architecture and the related wholesale Broadband Service do not allow this configuration to be unbundled and accessed as discrete network elements for a CLEC's use.

Q. WHAT IS THE DIFFERENCE BETWEEN A PORT ON THE OCD AND A STANDARD PORT ON A LOCAL SWITCH?

A. As mentioned above, the primary difference between an unbundled switch port and the port on the OCD is that with the OCD one individual line cannot be accessed. On a local circuit switch, there is a one-to-one correspondence between a standard voice switch port and a copper facility. In the case of the Project Pronto architecture, because multiple PVCs (representing multiple end user lines) are aggregated to one OCD port and because those PVCs are virtual, there is no one-to-one correspondence between an OCD port and a PVC (representing an end user line).

Q. DOES THE PROJECT PRONTO ARCHITECTURE CONSIST OF PACKET SWITCHING EQUIPMENT AND FUNCTIONALITY?

A. Yes. In its Project Pronto Order, the FCC found that the Project Pronto NGDLC is functionally equivalent to a DSLAM, and that the Project Pronto OCD is ATM packet

switching equipment.[13] Further, the FCC found in its UNE Remand Order that this type of equipment is packet switching equipment.[14]

Q. DID THE FCC REQUIRE THE UNBUNDLING OF PACKET SWITCHING FUNCTIONALITY?

A. Not as a general matter. The FCC decided against a general requirement to unbundle packet switching, stating in its UNE Remand Order that "given the nascent nature of the advanced services marketplace, we will not order unbundling of the packet switching functionality as a general matter."[15] The FCC went on to say:

> "the record in this proceeding, and our findings in the 706 Report, establish that advanced services providers are actively deploying facilities to offer advanced services such as xDSL across the country. … [C]arriers have been able to secure the necessary inputs to provide advanced services to end users in accordance with their business plans. This evidence indicates that carriers are deploying advanced services to the business market initially as well as the residential and small business markets."[16]

Q. UNDER WHAT CIRCUMSTANCES DID THE FCC REQUIRE THE UNBUNDLING OF PACKET SWITCHING FUNCTIONALITY?

A. The FCC's UNE Remand Order defines the limited circumstances under which packet switching must be unbundled. Specifically, the FCC's rules provide that:

> (B) An incumbent LEC shall be required to provide nondiscriminatory access to unbundled packet switching capability only where each of the following conditions are satisfied:

[13] In the FCC Project Pronto Order (00-336) the FCC stated "We likewise find that the OCD described by SBC should be classified as Advanced Services Equipment under the *Merger Conditions.* As SBC itself notes, the OCD is an Asynchronous Transfer Mode (ATM) switch that performs a critical routing function in providing advanced services to consumers served by the ADLU Card contained in NGDLC systems. The specific type of OCD that SBC plans to use is described by the manufacturer as an 'ATM switch.' As such, the OCD falls squarely within the definition in the *Merger Conditions.* Specifically, the *Merger Conditions* state that 'packet switches . . . such as ATMs . . . used to provide [a]dvanced [s]ervices are Advanced Services Equipment. FCC 00-336 at para 18.

[14] In the FCC UNE Remand Order (FCC Third Report and Order, CC Docket 96-98) the FCC stated "we find that the DSLAM is a component of the packet switch network element." FCC UNE Remand Order at para 175. Further the FCC stated that "We define packet switching as the function of routing individual data units, or 'packets,' based on address or other routing information contained in the packets. The packet switching network element includes the necessary electronics (e.g., routers and DSLAMs)." FCC UNE Remand Order at para. 304.

[15] Id. at para. 306.

[16] Id. at para. 307.

(i) The incumbent LEC has deployed digital loop carrier systems, including but not limited to, integrated digital loop carrier or universal digital loop carrier systems; or has deployed any other system in which fiber optic facilities replace copper facilities in the distribution section (e.g., end office to remote terminal, pedestal or environmentally controlled vault);

(ii) There are no spare copper loops capable of supporting the xDSL services the requesting carrier seeks to offer;

(iii) The incumbent LEC has not permitted a requesting carrier to deploy a Digital Subscriber Line Access Multiplexer at the remote terminal, pedestal or environmentally controlled vault or other interconnection point, nor has the requesting carrier obtained a virtual collocation arrangement at these subloop interconnection points as defined by § 51.319(b), and

(iv) The incumbent LEC has deployed packet switching capability for its own use.[17]

Two aspects of these FCC rules warrant emphasis. The requirement to unbundle the packet switching equipment described in the fourth condition is (1) dependent on the simultaneous existence of all four of these conditions in a particular service area, and (2) determined on an RT-site-by-RT-site basis.

Q. WOULD ANY OF THESE CONDITIONS BE CREATED BY DEPLOYMENT OF PROJECT PRONTO?

A. No. These four conditions would not be created by the deployment of Project Pronto. The first condition involves the presence of DLC or the replacement of copper loops with fiber. Because Project Pronto is an overlay network, it does not result in the replacement of copper loops with fiber, as I explained previously.

The second condition concerns the availability of copper loops. Copper loops will be available to the CLECs in most serving areas. As I explained above, the deployment of Project Pronto does not displace any existing copper loops, and, in fact, will usually free up working copper loops for future CLEC use. Additionally, SBC made various commitments

in the FCC Project Pronto Order to ensure that CLECs continue to have access to copper facilities after Project Pronto deployment. [18]

The third condition concerns the ability of a CLEC to remotely locate its DSLAM equipment at an Ameritech Illinois RT site. Ameritech Illinois does permit a CLEC to collocate its DSLAM equipment in an RT site where space and other environmental factors allow. In addition, SBC's commitments, adopted in the FCC's Project Pronto Order, enhance the CLECs' opportunity to collocate their own DSLAMs at or near the Ameritech Illinois RT sites. Specifically, Ameritech Illinois will, upon a CLEC's request, either increase the size of future RT structures or provide the CLEC with an adjacent cabinet structure upon request for collocation of a DSLAM. [19]

The fourth condition involves Ameritech Illinois' deployment of packet switching for its own use. With Project Pronto, Ameritech Illinois is not deploying any packet switching equipment for its "own use." The DSL-capable portion of the Project Pronto NGDLC RTs and the OCD equipment are being deployed by Ameritech Illinois only for CLECs' use in provisioning their own retail DSL services to end users.

Q. YOU PREVIOUSLY REFERRED TO THE "NECESSARY" AND "IMPAIR" STANDARDS ESTABLISHED IN THE 1996 ACT. WHAT ARE THESE STANDARDS?

A. In determining which network elements should be made available to CLECs on an unbundled basis, the Act requires an evaluation of whether (A) access to such network elements as are proprietary in nature is necessary, and (B) the failure to provide access to such network

[17] 47 C.F.R. 51.317.
[18] See FCC Project Pronto Order, FCC 00-336, SBC Commitments, page 41, Copper Maintenance and Notification.
[19] See FCC Project Pronto Order, FCC 00-336, SBC Commitments, page 39, Provision of Additional Space in or Adjacent to Remote Terminals.

elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer. [20]

Q. IF PROJECT PRONTO AND THE WHOLESALE BROADBAND SERVICE ARE NOT UNBUNDLED, WOULD THE CLECS BE IMPAIRED IN THEIR ABILITY TO PROVIDE DSL SERVICES?

A. No. Neither the Project Pronto architecture nor the wholesale Broadband Service offering have to be unbundled for CLECs to be able to provide DSL services to their end users on a fully competitive basis. In the words of the FCC, I do not believe that a lack of "unbundled" access to the Pronto DSL architecture or the wholesale Broadband Service would "materially diminish a requesting carrier's ability to provide the [DSL] services it seeks to offer." 47 C.F.R. 51.317(b)(1).

Q. CAN YOU PLEASE EXPLAIN THE BASIS FOR YOUR OPINION?

A. Yes. Assume for a moment that SBC had never voluntarily initiated the Project Pronto deployment. Certainly, CLECs could not be impaired without unbundled access to a non-existent broadband network (i.e., a broadband network that SBC had never deployed in Illinois). Furthermore, absent the voluntary deployment of SBC's Project Pronto initiative in Illinois, CLECs would have the ability to provide DSL services to end users using either their own central office-based DSLAMs and Ameritech Illinois' full copper loops (as stand-alone UNE loops or the related HFPL UNEs), or their own remotely-located DSLAMs and Ameritech Illinois' copper subloops (as stand-alone UNE subloops or the related HFPL UNEs). These options would be the same for any CLEC, including Ameritech Illinois' advanced services affiliate, and would not change as a result of Pronto DSL deployment.

[20] Telecommunications Act of 1996, Section 251(d)(2)(A-B)

In addition, if Ameritech Illinois did voluntarily deploy Project Pronto it would offer its end-to-end wholesale Broadband Service over this new architecture to all CLECs. As I explained previously, this Broadband Service provides CLECs with an additional option for offering DSL services to their end users, above and beyond the pre-existing network options available to the CLECs. Therefore, all of these CLECs would have a completely equal opportunity to utilize yet another option to provide DSL services. Therefore, no CLEC would be impaired without unbundled access to Project Pronto and/or the associated Broadband Service.

Q. CAN YOU SUMMARIZE THE CLECS' OPTIONS FOR OFFERING DSL SERVICES IF PROJECT PRONTO WERE DEPLOYED BUT NOT UNBUNDLED?

A. Yes. The options available to CLECs for providing DSL services would then include the following:

- Purchase of Ameritech Illinois' end-to-end wholesale Broadband Service offering.

- Leasing of Ameritech Illinois' full, unbundled copper loops for use with the CLECs' own central office-based DSLAMs to provide DSL services. Because Project Pronto is an overlay network design, Ameritech Illinois' existing copper facilities would still be available to CLECs as UNEs. Also, because Ameritech Illinois' wholesale Broadband Service allows an end user's POTS and ADSL service to be provided over the Project Pronto network architecture, use of the Broadband Service in this manner could actually free additional existing copper facilities that were previously used only for POTS.

- Leasing of Ameritech Illinois' unbundled copper subloops for use with the CLECs' own remotely-located DSLAM equipment (i.e., in or near Ameritech Illinois' RT sites, where space is available and other technical requirements are met) and leasing Ameritech

Illinois fiber transport facilities (in the form of dark fiber and/or unbundled sub-loops) from transport from such remote location to the central office.

- A CLEC also could undertake its own broadband initiative for the benefit of end users in Illinois, and deploy its own infrastructure to provide DSL services to more Illinois end users.

Q. WHAT ABOUT THE ARGUMENT THAT CLECs WOULD NEED "UNBUNDLED" PIECES OF THE PRONTO NETWORK TO KEEP UP WITH AMERITECH ILLINOIS' AFFILIATE OR THAT, GENERALLY SPEAKING, UNBUNDLING WOULD BE USEFUL TO CLECs AS A MEANS OF ENTRY?

A. From a practical perspective, I would note that the technical limitations of the NGDLCs that I explained above (i.e., that the NGDLCs to be deployed support ADSL service only) would apply equally to all carriers, including Ameritech Illinois' data affiliate, so CLECs could "keep up" with that affiliate by purchasing the wholesale Broadband Service. Indeed, the FCC noted that CLECs could use the Pronto architecture and differentiate their own service offerings without the need for any kind of "unbundled" access to Pronto equipment.

Q. CAN YOU EXPLAIN HOW A CLEC COULD DIFFERENTIATE ITS DSL OFFERINGS EVEN WITHOUT "UNBUNDLED" ACCESS TO THE PRONTO DSL ARCHITECTURE?

A. Yes. At least three of the commitments of SBC ILEC's in the Project Pronto Order ensure that CLEC scan compete by offering differentiated service. First, there are commitments to facilitate competitive access to remote terminals. The FCC concluded that this would "enable[] unaffiliated carriers to deploy equipment used to provide different types of DSL service" and also "does not eliminate any options currently available to competitive LECs under our rules."[21] Second, the SBC ILECs' commitment to ensure continued access to existing copper facilities will "enable [CLECs] to provide different types of xDSL services"

and thus "be able to deliver different applications, such as video and voice over DSL, than those chosen by SBC."[22] Third, as mentioned previously, SBC is hosting an industry wide collaborative to investigate the potential of offering other services than those currently available with the Broadband Service offering in the future. Decisions to make available such new features and functions are dependent upon the various conditions listed in paragraphs 8 and 11 of the SBC Commitments (attached to the FCC Project Pronto Order). Paragraphs 8 and 11 contain various issues that would have to be resolved before SBC would deploy a new feature and/or function, including but not limited to issues related to overall network capacity and/or technical feasibility. The FCC concluded that "the collaborative session process in SBC's proposal adequately addresses the requests of AT&T, DATA, and others concerning the on-going development of new services and the risk that SBC's incumbent LECs will discriminate in favor of their chosen technology… The collaborative sessions provide a regular forum for competitive LECs to have their own needs considered and met on an equivalent basis to SBC's Advanced Services Affiliate."[23] The FCC also stated that as a result of SBC's commitment in relation to the collaborative process, "SBC's competitors will have a greater ability to differentiate their product offerings and will not be locked into the features chosen by SBC. Such a commitment also addresses any incentive SBC may have to refrain from implementing additional features of existing equipment as they are released."[24]

Q. CAN A CLEC DIFFERENTIATE ITS SERVICE WITH THE BROADBAND SERVICE OFFERING WHEN IT IS LIMITED TO AN ADSL SERVICE AT THIS TIME?

[21] Project Pronto Order at para. 35.
[22] Id. at para. 40.
[23] Id. at para. 43.
[24] id at 45

A. Yes. Currently the Alcatel Litespan 2000 system provides CLECs the ability to establish services at varying speeds with their ADSL service. For example, the Alcatel system provides CLECs the capability to provision downstream speeds ranging from 32 kbps to 8132 kbps in increments of 32 kbps. Further, the Alcatel system also provides CLECs the capability to establish upstream service ranging from 32 kbp to 384 kbps also in increments of 32 kbps. The net result is that there are numerous combinations of services (in terms of downstream and upstream speed) that can be established over the Project Pronto network architecture.

In order to provide CLECs the full capabilities in terms of speed of service over this architecture, SBC developed a means for CLECs to establish numerous service profiles consisting of these different speed combinations. For example, one service profile may be a 1.544 Mbps downstream service offered with a 384 kbps upstream service. Another profile may offer different speed settings. The Broadband Service offering provides CLECs the ability to determine which speed of service offerings they would like to provide by offering them the use of the full range of values as outlined above. SBC developed a new system referred to as the Broadband User Profile Graphical User Interface ("BOP-GUI") that provides CLECs the ability to differentiate their services in terms of speed by providing them the same level of flexibility as would be provided by the Alcatel Litespan equipment.

VII. LIT FIBER SUBLOOPS

Q. TURNING TO THE SPECIFIC UNEs ORDERED BY THE COMMISSION, WHAT IS THE FIRST NEW "UNE" YOU WILL DISCUSS?

A. The first item ordered by the Commission in terms of unbundling the Project Pronto architecture is lit fiber subloops between the RT and the OCD consisting of one or more PVPs and/or one or more PVCs at the option of CLEC.

Q. WHAT ARE PVPs AND PVCs?

A. As I explained earlier, the physical facility used to transport data traffic from an NGDLC RT to the OCD in a central office is called an OC-3c. Within the OC-3c, data packets are transported using Permanent Virtual Circuits ("PVCs"), which travel within a Permanent Virtual Path ("PVP"). A PVP dedicates a fixed amount of bandwidth within the Project Pronto data OC-3c fiber facility. A PVP typically provides this block of bandwidth to a set of PVCs that are allocated within that individual PVP. For example, a 30 Mpbs PVP could be used to provide transport to a set of PVCs that would all have access to that same 30 Mpbs of bandwidth. One PVP is dedicated to each channel bank in an NGDLC. Thus, as an analogy, a PVP is like a highway between two points and the PVCs are the various lanes in that highway. Mr. Keown discusses PVCs and PVPs in more detail in his testimony.

Q. ARE "LIT FIBER SUBLOOPS" PROPERLY TREATED AS "UNEs" IN CONJUNCTION WITH PROJECT PRONTO DEPLOYMENT?

A. No. First, while it might technically be possible to provide a PVC or PVP on an "unbundled" basis, the detrimental impact that such an offering would have on Ameritech Illinois' ability to manage its network and additional practical considerations in terms of Ameritech Illinois' ability to service end users make this arrangement infeasible.[25] Second, in terms of offering these "elements" as "subloops," given the FCC definition of sub-loop as explained below in

[25] As noted in the First Report and Order, paragraph 203, the ILEC's ability to manage its network is a consideration in determining technical feasibility. "We also conclude, however, that legitimate threats to network reliability and security must be considered in evaluating the technical feasibility of interconnection or access to incumbent LEC networks. Negative network reliability effects are necessarily contrary to a finding of technical feasibility. Each carrier must be able to retain responsibility for the management, control, and performance of its own network. "

the discussion of the copper subloop elements created by the Commission here, no such subloops are technically accessible within an RT site.

Q. PLEASE EXPLAIN THE PROBLEMS WITH PROVIDING PVPs AS A "UNE."

A. The current version of NGDLC being used by SBC (the Litespan 2000 system) provides only one dedicated PVP per channel bank assembly. Thus, in order to provide a CLEC a PVP as a UNE, Ameritech Illinois would have to dedicate an entire channel bank to that CLEC's use; once a single CLEC controlled the PVP, nobody else would be able to transport their data traffic to the serving central office.

Consider that a typical Project Pronto deployment will be in a cabinet configuration that provides for three DSL-capable channel banks. Therefore, in a given RT site with this configuration deployed, Ameritech Illinois would in effect have to dedicate one-third of the available capacity in that RT site to a particular CLEC – whether that CLEC was providing service to one customer or many customers. Mr. Keown addresses this problem in more detail in his direct testimony.

Q. DOES OFFERING A PVP CREATE A SCENARIO WITHIN WHICH A CLEC COULD IN EFFECT MONOPOLIZE ALL OF THE CAPACITY IN A GIVEN RT SITE?

A. Yes. Schedule CJB-6 addresses how this specific instance could occur. As addressed in my response above, the Litespan 2000 system provides for only one PVP per channel bank. As is illustrated in Schedule CJB-6, each DSL channel bank deployed within the NGDLC system is wired out to a Serving Area Interface ("SAI") that then provides service to a subset of end user customers. However, as shown in Schedule CJB-6, each DSL channel bank is not typically wired out to every SAI location out of an RT site. Therefore, in order to be able to

serve all end users geographically served out of a given RT location, a CLEC would have to have a PVP in each channel bank, essentially dedicating for itself use of the entire RT site.

Q. BUT WOULDN'T A LOGICAL CLEC LEASE A PVP ONLY WHEN IT HAD A SUFFICIENT NUMBER OF CUSTOMERS IN THE AREA REACHABLE FROM THAT PVP'S CHANNEL BANK, AND LEASE INDIVIDUAL PVCs TO REACH AREAS WHERE IT HAD FEWER CUSTOMERS?

A. Not necessarily. This is an important point, as it highlights how defining a PVP as a UNE would not only lead to inefficiency, but also facilitate anti-competitive conduct by CLECs. The fact that a CLEC can obtain complete or near-complete control over a particular geographic area by leasing a PVP "UNE" could lead to a race to reserve PVPs at each new RT site. The first CLEC to reserve the PVP (or all three PVPs in the RT, thus entirely monopolizing the area served by that RT) would have two advantages over all other CLECs. First, knowing that no other CLEC could use the facilities in the RT to provide DSL service in the area served by the RT, the first CLEC could engage in blitz marketing in that area to sign up as many customers as possible during the period it leased the PVP(s). Thus, for example, a CLEC could have no customers in the area served by an RT but lease all three PVPs for a month, then go door-to-door marketing in that area for a month before it decides whether it wants to keep leasing the PVP or not. By doing so, that CLEC would have a minimum one-month head start on all other CLECs in serving that particular area.

Second, a CLEC could lease PVPs not to serve any of its own DSL customers, but to act as the gatekeeper for data traffic between that RT and the serving central office by sub-leasing capacity on the PVP to other CLECs. The gatekeeper CLEC's rates, of course, would be unregulated and could further impede competition.

Q. IF THE VENDOR OF SBC'S NGDLCs DEVELOPED THE CAPABILITY TO PROVIDE MULTIPLE PVP PER CHANNEL BANK, WOULD IT THEN BE FEASIBLE TO OFFER A PVP AS A "UNE"?.

A. Even if SBC's NGDLC vendor offered a multiple PVP per channel bank scenario, there would be significant capacity and service level impacts to be considered in SBC's planned network deployment, as is further illustrated by Schedule CJB-6. As shown, an OC-3c provides 155 Mbps of total bandwidth. Of this, 20 Mbps are used for overhead and common control. Therefore, 135 Mbps are typically available for service provisioned across this OC-3c. As illustrated, for each PVP offered by Ameritech Illinois to a CLEC, less bandwidth would be available for other CLECs to use. For example, if a CLEC were to be dedicated a 30 Mbps PVP, there would be only 105 Mbps (135 Mbps less 30 Mpbs) of bandwidth left for all of the other traffic not dedicated to that particular CLEC. If two CLECs were provided 30 Mbps PVPs, this figure would be reduced to 75 Mbps for all other services, and so on.

Thus, there are three technical issues. First, dedicating bandwidth to a CLEC impacts the available bandwidth that could be shared amongst all other CLECs. Second, because all of the remaining CLECs would be sharing less bandwidth (after the dedication of bandwidth to another CLEC as part of a PVP offering) the service levels provided to those CLECs' customers would be adversely impacted, as they would be sharing less bandwidth than could otherwise be made available. Third, offering a PVP to CLECs calls into question Ameritech Illinois' ability to efficiently manage its network given the capacity impacts outlined throughout my testimony and the testimony of Mr. Keown.

Q. YOU MENTIONED ABOVE, IN THAT THE CURRENT SITUATION WHERE A CLEC MUST BE DESIGNATED AN ENTIRE CHANNEL BANK AND POTENTIALLY THE ENTIRE RT SITE IN CONJUNCTION WITH A PVP THAT THERE ARE POTENTIAL ANTICOMPETITIVE IMPLICATIONS OF THIS OFFERING. ARE THERE ANY SUCH COMPLICATIONS WITH OFFERING A PVP IN THIS SCENARIO WHERE THERE ARE MULTIPLE PVPS PER CHANNEL BANK?

A. Yes. This is due to the fact that amount of available bandwidth from the RT to the OCD is constant. Consider a hypothetical situation where a PVP may make sense to a CLEC perhaps to offer service to a large business park served by a particular RT site. By allocating CLECs a PVP (and essentially a fixed amount of the available bandwidth), the CLEC could demand a significant amount of bandwidth in the NGDLC to provide specialized services to this one business location. Because the Pronto architecture is designed for mostly small business and consumer use, this re-allocation of bandwidth to a large enterprise could limit the availability of ADSL service to the Project Pronto deployment's intended base.

For example, as I mentioned in outlining the Project Pronto architecture, the most common deployment of the Litespan 200 equipment is in a cabinet configuration that is capable of serving approximately 672 end users – using one OC-3c transport facility. If a CLEC were provided a PVP over this transport facility that utilized a large amount of bandwidth directed at a large business customer, there may not be sufficient bandwidth to continue to serve the intended base of 672 customers. Thus, those customers would (assuming they are beyond the 18 kft barrier of traditional DSL service) be lacking the capability to establish DSL service. The end result is that DSL would not be an available service to those consumers.

Q. WOULD THE SAME PROBLEMS EXIST WITH THE WHOLESALE BROADBAND SERVICE?

A. No. With the Broadband Service no single carrier would have an assigned chunk of bandwidth, so all customers would have access to whatever bandwidth was available at the time of the transaction.

Q. DO PROBLEMS ALSO EXIST WITH TRYING TO DEFINE A PVC AS A "UNE"?

A. Yes. A PVC cannot be offered as an individual unbundled network element. Because the PVC is provided within the ATM bitstream and not as a "stand alone" communication, the

OCD's routing and aggregation functionality is necessary to route the PVC to the appropriate CLEC. Therefore, it is technically infeasible to provide simply a PVC without the OCD component. Likewise, the DSLAM-like functionality provided within the NGDLC RT site is necessary to provide the packet switched portion of the network. Thus, it is not technically feasible to offer a PVC without also providing the OCD and the NGDLC.

Furthermore, because the OCD cannot hand-off traffic to a CLEC on a line-by-line basis (the OCD aggregates traffic to CLECs at the DS3 and OC3 speed), there is no means to "access" a single PVC on a line-by-line basis in any practical manner. This is because the OCD, as deployed by SBC with its Project Pronto deployment, is only equipped with DS3 and OC3 ports and has only a limited number of ports. Therefore, each individual PVC is aggregated to either an OC3 or DS3 port (at the option of the CLEC) for delivery to a CLECs collocation arrangement. A DS3 port has the potential to serve upwards of 1000 PVCs and an OC3 port upwards of 4000 PVCs. Such higher-level facilities would not technically be used for delivery of one PVC to a CLEC collocation arrangement. In fact, there is no technical means to provide an individual DS0 hand-off (representing one end user line analogous to a single copper loop) from the OCD to a CLEC collocation arrangement lacking a complete re-arrangement of the Project Pronto network architecture in the central office.

VIII. UNBUNDLED COPPER SUBLOOPS

Q. WHAT IS THE SECOND "UNE" ORDERED BY THE COMMISSION?

A. The second item ordered to be "unbundled" consists of copper subloops consisting of the following segments:

i. The copper subloop from the RT to the NID at the customer premises;

ii. The copper subloop from the RT to the SAI ("serving area interface");

iii. The copper subloop from the SAI to the NID at the customer premises.

Q. ARE THESE NEWLY PROPOSED UNEs TECHNICALLY FEASIBLE?

A. Neither of the first two elements mentioned above are technically feasible given Ameritech Illinois' planned Project Pronto deployment. The third sub-loop segment ordered above (cooper sub-loop from the SAI to the NID) is one of the sub-loops established by the FCC in the FCC UNE Remand Order and is currently available to CLECs, irrespective of Project Pronto.

Q. PLEASE EXPLAIN WHY IT IS NOT POSSIBLE TO "UNBUNDLE" SUBLOOPS BETWEEN EITHER THE NID OR SAI AND THE RT.

A. The problem has to do with the lack of recognized accessible point to these new "UNEs." In its UNE Remand Order, the FCC defined a subloop as follows: "We define subloops as portions of the loop that can be accessed at terminals in the incumbent's outside plant. An accessible terminal is a point on the loop where technicians can access the wire or fiber within the cable without removing a splice case to reach the wire or fiber within." The FCC clarified this definition as follows: "Accessible terminals contain cables and their respective wire pairs that terminate on screw posts. This allows technicians to affix cross connects between binding posts of terminals collocated at the same point."[20]

As is illustrated in Schedule CJB-7 to my testimony there is no such access point or ability for technicians to place a cross-connect to the NGDLC equipment in an RT. Instead, line cards in the NGDLCs are physically inserted into the backplane connectors and wiring of the NGDLC RT equipment. Copper pairs from the field (i.e., from the SAIs) terminate onto the backplane wiring. Thus, there is no capability to physically access sub-loops at either the line card or inside the NGDLC. Thus, because no sub-loops are technically available to be

accessed within the NGDLC RT, neither of the first two elements ordered by the Commission as outlined above – unbundled copper subloops accessible at the RT – are technically feasible.

IX. ADLU CARDS OWNED BY CLECs/ILECs AS UNEs

Q. WHAT IS THE THIRD "UNE" ORDERED BY THE COMMISSION IN THIS CASE?

A. The third item ordered by the ICC was that Ameritech Illinois provide ADLU line cards owned by the CLEC and "collocated" in the NGDLC equipment in the RT as a "UNE."

Q. IS THE NEW "UNE" APPROPRIATE?

A. No. First, line cards are inappropriate for CLEC "collocation," as explained in detail later in my testimony. However, beyond the inappropriateness of CLEC line card "collocation," the logic supporting this particular "UNE" is flawed. The very concept of unbundled network elements implies that such network elements are a portion of the ILEC's network. A line card that is not owned and/or deployed by the ILEC is not a portion of the ILEC's network. Therefore, such a line card, if owned and provisioned by a CLEC, could neither be offered as a UNE nor provisioned as a portion of a UNE.

Q. WHAT IS THE FOURTH "UNE" ORDERED BY THE COMMISSION IN THIS CASE?

A. The fourth new "UNE" created by this order is an "unbundled" line card owned by the ILEC.

Q. IS THIS NEW "UNE" TECHNICALLY FEASIBLE?

A. This arrangement is not technically feasible. ILECs technically cannot provide CLECs use of a line card as a so-called UNE without the use of the other alleged UNEs proposed in the Order. For example, a line card by itself would provide no practical use to a CLEC. The line

[26] UNE Remand Order at para. 206.

card cannot function lacking the entire NGDLC system, and offering the line card as a separate stand-alone "UNE" would not be possible without the use of the entire NGDLC system and associated fiber and copper facilities.

Q. COULD THE REQUIREMENT TO PROVIDE THIS "LINE CARD UNE" CREATE AN OBLIGATION THAT AMERITECH ILLINOIS PROVIDE NEW COMBINATIONS?

A. Yes. Given the fact that the Commission Order in this case establishes that the copper facilities terminating to the backplane of the connector to the line card slot and that the PVCs and PVPs used for data transmission from the line card are so-called "UNEs," an order that establishes the line card by itself as a so-called UNE creates in essence an obligation for Ameritech Illinois to provide new UNE combinations. This is because, as mentioned above, the line card cannot be used lacking the copper facilities and optical transport elements that have also been defined by this Commission as "UNEs" in this proceeding.

X. A PORT ON THE OCD, AND COMBINATIONS OF MULTIPLE "UNEs"

Q. WHAT IS THE FIFTH NEW "UNE" ORDERED BY THE COMMISSION?

A. The fifth new "UNE" proposed by the Commission is a port on the OCD in the central office.

Q. IS THIS NEW "UNE" APPROPRIATE AND/OR TECHNICALLY FEASIBLE?

A. While this newly ordered "UNE" may be technically possible, there are significant capacity concerns that must be considered. Further, because the OCD is an ATM switch (and as such a portion of the packet switched network) it is inappropriate to order that this port be provided as a UNE. I have already addressed previously the limited set of circumstances that would require an ILEC to provide CLECs access to packet switching and have further explained why those circumstances fail to apply to Project Pronto.

Q. PLEASE EXPLAIN THE CAPACITY LIMITATIONS OF THE OCD.

A. As explained previously, the OCD is used to aggregate inbound traffic from all of the RTs placed outside of a given wire center to various CLECs. As outlined, in most instances there will be 16-24 RT sites subtending each OCD. Therefore, 16-24 OC-3cs will be terminated into each OCD. The OCD is a port-limited device. Similar to the Litespan system, there are slots in the OCD within which cards can be placed at varying speeds. The OCD that Ameritech Illinois had planned to deploy in Illinois was the Cisco 6400 ATM switch. This device provides for either OC-3c or DS3 cards to be placed. With the Cisco 6400, the OC-3c card is a two port card – meaning that for each OC-3c card placed within the Cisco 6400, two OC-3cs can be served. The Cisco 6400 device provides slots to accommodate 16 cards.

Therefore, in order for this OCD to provide service to the inbound traffic, for example from 20 RT sites, Ameritech Illinois would have to fully utilize at a minimum 10 of the available slots for the placement of OC-3c cards (assuming one OC-3c per RT and two OC3c ports per card). This means that six vacant slots would remain (consider that the OCD provides 16 slots – of which you must use 10 to service the 20 inbound OC-3cs for each RT site given the two port card) within which DS3 and OC3 cards could be placed. The DS3 card is also a two port card – thus the remaining available capacity within the OCD in this scenario would be 12 remaining ports (whether DS3 or OC3c ports). Ameritech Illinois intended to use this capacity to provide CLECs ports on the OCD in conjunction with its Broadband Service and/or to support additional RT locations needed for growth.

Q. PLEASE EXPLAIN WHY, IF THERE IS SOME AVAILABLE CAPACITY IN THE OCD, AMERITECH ILLINOIS HAS CONCERNS WITH UNBUNDLING THE OCD?

A. The primary concern with the unbundling of the OCD from a capacity standpoint is that if CLECs were provided OCD "UNEs" there is the potential that all of the remaining capacity

in the OCD could be utilized and as such the OCD could be prematurely exhausted. Consider, using the example above, with the Cisco OCD there are approximately 12 ports available for future RTs and for routing and aggregation of traffic to CLECs. If the OCD were unbundled, there is a potential that CLECs could purchase all of the remaining capacity on the OCD for whatever purpose that CLEC may have – thus forcing Ameritech Illinois to deploy an additional OCD at significant cost in order to service the placement of additional RT sites and/or provide other CLECs OCD ports in conjunction with the Broadband Service.

Q. HOW IS THIS DIFFERENT FROM THE OCD PORT THAT IS PROVIDED FOR CLECS TO USE WITH THE SBC BROADBAND SERVICE?

A. The use of the OCD port in conjunction with the SBC Broadband Service is fundamentally the same as the proposed "unbundled" OCD port with at least one primary difference. Because with the Broadband Service SBC essentially controls the OCD and limits it use to service RT sites, there would be no situation within which a CLEC may attempt to utilize the OCD for some purpose other than for the aggregation of traffic from RT locations.

Q. CAN YOU THINK OF A SITUATION IN WHICH A CLEC MAY USE THE OCD FOR SOME OTHER PURPOSE THAN TO OBTAIN ACCESS TO DATA TRAFFIC FROM RT SITES?

A. Yes. If in the future Ameritech Illinois were to deploy an ATM backbone network, CLECs could utilize the ATM switching capability of the OCD in order to avoid a requirement to collocate their own ATM switching equipment in an end office.

Q. THE COMMISSION ORDER IN THIS CASE ALSO ORDERED AMERITECH ILLINOIS TO OFFER ANY COMBINATION OF THE PREVIOUSLY MENTIONED "UNEs". IS THIS FEASIBLE?

A. As I have addressed above in relation to each of the specific new UNEs ordered by the Commission, several of these elements are not technically feasible, directly impact Ameritech Illinois ability to manage its network and/or create significant network capacity impacts that

make the offering of such UNEs impractical. Such new so-called UNEs and/or combinations of UNEs cal into question the performance and reliability to Ameritech-Illinois network and are not accessible given the interworking nature of the Project Pronto equipment. Therefore, any combination consisting of many of these elements does not alleviate these concerns.

Q. ONE OF THE NEW COMBINATIONS PROPOSED BY THE COMMISSION WAS A "LINE SHARED LOOP FROM THE OCD TO NID". IS IT TECHNICALLY FEASIBLE AND/OR PRACTICAL FOR AMERITECH ILLINOIS, GIVEN ITS PLANNED PROJECT PRONTO DEPLOYMENT, TO PROVIDE ONE LINE SHARED LOOP TO CLECS OCD TO NID?

A. It is not technically feasible to provide access to one line shared loop from OCD to NID. This is due to the fact that the OCD and the NGDLC Pronto architecture does not provide access to individual lines, as explained throughout my testimony. However, it is technically possible to provide the "SBC Broadband Service" as an end-to-end offering -- which is precisely what the SBC Broadband Service consists of. As mentioned previously, with the end-to-end Broadband Service, SBC aggregates data traffic from multiple RT sites to a CLEC port leased on the OCD for delivery to a CLEC collocation arrangement. However, it should be noted that although it is possible to provide the Broadband Service as an end-to-end offering it is not possible to access one "line shared loop OCD to NID" over this architecture. This is due to the fact that the OCD provides the only technically feasible means of access to data traffic over this architecture and requires a DS3 or OC3c level hand-off to access multiple end user lines.

XI. CLEC LINE CARD COLLOCATION

Q. WHY DO YOU BELIEVE CLECs WANT TO COLLOCATE THE NGDLC LINE CARDS?

A. There appear to be two reasons that the CLECs want to collocate the NGDLC line cards. The first reason is that these CLECs want to be able to provide different "flavors" of DSL using

their own types of line cards in the Project Pronto architecture. The second and probably more important reason is that the CLECs want to use a collocated line card to justify unbundled access to the parts of the Project Pronto architecture on either side of the line card.

Q. WHICH TYPES OF DSL CAN BE PROVIDED WITH THE PLANNED AMERITECH ILLINOIS PROJECT PRONTO ARCHITECTURE?

A. As addressed previously, the Project Pronto architecture can currently support ADSL. The SBC ILECs have also committed to making G.lite available on an RT-by-RT basis starting within six months after development and commercial availability from the NGDLC manufacturer.[27]

Q. IN GENERAL, WHAT COMMITMENTS HAS SBC MADE REGARDING THE DEPLOYMENT OF DIFFERENT TYPES OF LINE CARDS IN THE PROJECT PRONTO NGDLC SYSTEMS?

A. As outlined previously in my testimony, SBC will work collaboratively in the future with individual CLECs, groups of CLECs, and the industry at large to introduce additional capabilities into the Project Pronto architecture, subject to the criteria outlined in the FCC's Project Pronto Order.[28]

Q. CAN ANY MANUFACTURER'S DSL LINE CARDS BE USED IN THE PROJECT PRONTO NGDLC RTs?

A. No, as addressed in the testimony of Dr. Niel Ransom from Alcatel, only the NGDLC manufacturer's line cards can be used in its NGDLC equipment.

Q. DO YOU AGREE THAT CLEC PLACEMENT OF LINE CARDS IN PRONTO NGDLCs CAN BE CLASSIFIED AS "COLLOCATION"?

A. In my opinion this would not be true "collocation" and is inconsistent with the FCC's criteria for collocation of equipment for two reasons. First, a piece-part of a unit of equipment, such

[27] Project Pronto Order, Appendix A, paragraph 4.
[28] Id., Appendix A, paragraphs 4(a), 4(b), and 8.

as a line card, does not constitute equipment appropriate for collocation. Second, placement of a line card into an NGDLC does not meet the Act or the FCC's criteria for collocation because it does not provide a CLEC with access to UNEs or interconnection to Ameritech Illinois' network.

Q. WHAT DOES THE FCC DESCRIBE AS EQUIPMENT THAT MAY BE COLLOCATED?

A. In its Advanced Services Order, the FCC described the equipment eligible for collocation as including DSLAMS, routers, ATM multiplexers, and remote switching modules.[29] In addition, the FCC specified in Section 51.323 of its rules, which addresses collocation, that "[a]n incumbent LEC shall permit the collocation of any type of equipment used or useful for interconnection or access to unbundled network elements."[30] This same rule further stated that equipment qualifying for collocation included:

(1) Transmission equipment including, but not limited to, optical terminating equipment and multiplexers, and

(2) Equipment being collocated to terminate basic transmission facilities pursuant to §§ 66.1401 and 64.1402 of this chapter as of August 1, 1996.

(3) Digital subscriber line access multiplexers, routers, asynchronous transfer mode multiplexers, and remote switching modules.

In every case, the FCC cites complete, stand-alone items of network equipment, not piece-parts or sub-components that make up these complete items of network equipment. This demonstrates that the FCC does not consider such piece-parts or sub-components to be equipment eligible for collocation.

Q. HAVE THESE FCC RULES BEEN VACATED BY THE COURTS?

[29] Id. at para. 28.
[30] 47 C.F.R. § 51.323(b).

A. Yes. I understand that the appellate court held, among other things, that allowing collocation of any equipment that was merely "used and useful" for interconnection or access to UNEs was too broad a standard.

Q. WHY DO YOU BELIEVE THAT AN ADLU LINE CARD IS NOT EQUIPMENT THAT IS APPROPRIATE FOR COLLOCATION?

A. Because a line card is not a complete piece of equipment with stand-alone functionality. For example, pieces of equipment that may be collocated for the provision of advanced service may include such devices as (1) DSLAMs or functionally equivalent equipment, (2) spectrum splitters that are used solely in the provision of advanced services, (3) packet switches and multiplexers such as ATMs and Frame Relay engines used to provide advanced services, (4) modems used in the provision of packetized data, and (5) DACS frames used only in the provision of advanced services. All of the devices mentioned above are separate stand-alone pieces of equipment.

The difference between these pieces of equipment and a line card is that the line card provides no practical benefit (e.g. service) to a CLEC lacking the other associated components of the entire NGDLC system. Specifically, an ADLU line card cannot function without (1) the additional NGDLC RT cards that provide common functions for the RT, (2) the other NGDLC RT hardware components such as the shelves, connectors, and wiring that house and interconnect all of the line cards and common cards within the RT, and (3) the system software in the NGDLC RT. Therefore, the ADLU card does not constitute an item of equipment that qualifies for collocation. By contrast, all of the aforementioned pieces of equipment do provide a distinct capability to a CLEC without any other components or pieces of the network.

Q. CAN YOU DESCRIBE IN MORE DETAIL THE LINE CARDS THAT THE CLECS WISH TO "COLLOCATE" AND WHY YOU DO NOT VIEW THEM AS "COMPLETE" PIECES OF EQUIPMENT?

A. Yes. The type of Project Pronto NGDLC line card currently available from Alcatel, the manufacturer of the Litespan platform, is the ADSL Digital Line Unit ("ADLU") card. The ADLU card is inserted into a shelf within a channel bank in a complete NGDLC RT equipment unit. This ADLU card contains some of the electronic circuitry that enables the NGDLC RT to perform the various signal conversion and multiplexing functions for an end user's ADSL signal. The ADLU card cannot perform any of these functions by itself, as it is only a piece-part or sub-component of the overall NGDLC RT equipment unit. To use an analogy, the ADLU card is similar to a gear within a wrist-watch. The gear is not the device that provides the time to the wearer of the watch, but instead, is only a piece-part of the watch, and merely works in combination with the rest of the parts of the watch to keep time.

Q. ASIDE FROM THE LACK OF STAND-ALONE CAPABILITY, DOES A LINE CARD MEET THE ACT'S AND THE FCC'S REQUIREMENT THAT COLLOCATED EQUIPMENT BE NECESSARY FOR INTERCONNECTION OR ACCESS TO UNEs?

A. Not in my opinion. Placement of an ADLU card into a Pronto NGDLC RT would not provide a CLEC with access to UNEs currently available at an RT, nor would it provide for interconnection between Ameritech Illinois' network and a CLEC's network for the mutual exchange of traffic.

Q. WHICH UNEs CAN BE ACCESSED BY COLLOCATING IN AN RT?

A. There are only two UNEs that may be accessible to a CLEC at an RT site. The first is unbundled dark fiber. Unbundled dark fiber is available at an RT site only if the RT is fed by fiber cable, and if sufficient fiber strands are spare and unlit. The second is unbundled copper distribution subloops, including the full subloop or just the high frequency portion of the subloop. These unbundled subloops are available at an RT only if the CLEC's collocated

equipment is cabled to the nearest cross-connect access point to those subloops (e.g., the SAI cabinet), or to the "engineering controlled splice" referred to in SBC's commitments attached to the FCC's Project Pronto Order.[31]

Q. CAN A CLEC OBTAIN ACCESS TO EXISTING UNEs AVAILABLE AT AN RT BY PLACING AN ADLU CARD INTO PRONTO NGDLC EQUIPMENT?

A. No. The ADLU card is not capable of providing access to any UNE. As I previously explained, the ADLU card is only a sub-component of the complex system of electronics and software that collectively make up the complete functionality of a NGDLC RT. There are no means to physically cross-connect the ADLU card to any UNE at the RT; instead, it can only be physically inserted into the rest of the NGDLC RT.

Q. CAN A LINE CARD PROVIDE FOR THE "MUTUAL EXCHANGE OF TRAFFIC"?

A. No. A line card by itself is not a switch nor is it capable of providing a switching functionality. In the case of the ADLU card, the card itself splits the voice and data signal and then, in conjunction with the entire NGDLC system packetizes the data signal for transport to the central office. The actual switching, routing and aggregation of the data traffic from each RT site is performed by the OCD device and is performed neither by the line card itself nor the entire NGDLC system.

Q. ARE THERE OTHER REASONS WHY THE LINE CARD SHOULD NOT BE COLLOCATED BY THE CLECs?

A. Yes. These other reasons include adverse impacts on (1) the usable capacity of the NGDLC RTs, (2) service provisioning, and (3) maintenance and repair. These impacts are further addressed in the testimony of Mr. James Keown and Mr. Derrick Hamilton.

[31] Project Pronto Order, Appendix A, paragraph 5.

XII. REPLY TO COMMISSIONER SQUIRES'S QUESTIONS

Q. WHAT QUESTIONS RAISED BY COMMISSION SQUIRES WILL YOU BE ADDRESSING IN YOUR TESTIMONY?

A. I will be addressing questions 1(A) (in part), 2, 3 (A) (i), 5, 6 (A) and (C), and 8 (A) and (B).

Q. PER COMMISSIONER SQUIRES'S QUESTION 1(A), PLEASE DISCUSS THE RULE 317(b)(2) FACTORS AS THEY BEAR ON EACH OF THE COMPETITIVE ALTERNATIVES OUTSIDE THE ILEC's NETWORK.

A. The factors in FCC Rule 317(b)(2) (47 C.F.R. 51.317(b)(2)) are analyzed to help determine whether alternatives to a proposed UNE are "available as a practical, economic, and operational matter." Application of these factors to the evidence being presented by all Ameritech Illinois' witnesses is largely a matter for legal briefs, but I will attempt to concisely address these factors from a non-legal, factual and policy perspective here with respect to the CLEC's competitive alternatives of self-provisioning, DSLAM collocation, and use of non-DSL technologies.

Cost.

1. Self-provisioning. Not having access to CLECs' cost structures or negotiations with equipment vendors, it is impossible to answer the cost question from the CLECs' perspective. From Ameritech Illinois' perspective, however, "unbundling" the Pronto DSL facilities would create significant new costs for Ameritech Illinois that would have to be recovered from CLECs through the "UNE" rates. Of course, the wholesale Broadband Service would offer the benefits of UNE pricing without the need to pass along to CLECs all of the additional costs that Ameritech Illinois would incur to actually "unbundle" Project Pronto DSL facilities (if it deployed them at all).

2. DSLAM Collocation. Like self-provisioning, collocation of a DSLAM is largely an up-front cost that is difficult to compare to the monthly recurring costs of "UNEs" or line card "collocation" over the long run.

3. Other Technologies. As noted above, both up-front and incremental deployment costs of wireless/satellite technologies are generally much lower than the costs for cable modem and DSL service.

Timeliness.

1. Self-provisioning. It is difficult to predict how quickly a CLEC could use self-provisioning to enter or expand its presence in the advanced services marketplace, but the basic time to obtain equipment from vendors should be the same for ILECs and CLECs. For CLECs that have not yet started their own deployment, the wholesale Broadband Service would offer an instant means of reaching a large number of new DSL customers quickly.

2. DSLAM Collocation. The standard provisioning interval for the wholesale Broadband Service is three days, which would inevitably be faster than DSLAM collocation. Because the processes and intervals for provisioning Pronto "UNEs" are unknown, I cannot compare them to DSLAM collocation at this time.

3. Other Technologies. As noted above, deployment of wireless of satellite service, both initially and incrementally, is generally much faster than for DSL or cable modem service.

Quality.

1. Self-provisioning. Self-provisioning would give CLECs substantially more control over the quality of service they provide than "unbundling" would. Use of the wholesale Broadband Service, rather than individual Pronto DSL "UNEs," would also help the CLEC ensure it received the exact same service quality as any Ameritech Illinois customer. For a

discussion of the adverse impact on quality of service that would result from "unbundling" the Pronto DSL facilities, see Mr. Hamilton's direct testimony.

2. DSLAM Collocation. I expect CLECs will comment on any quality-of-service issues raised by DSLAM collocation. From Ameritech Illinois' perspective, we already know how to deal with DSLAM collocation and provide quality unbundled loops and subloops; if, however, we had to provide all the new "UNEs" described in the Order, the adverse quality-of-service effects discussed by Mr. Hamilton would arise.

3. Other Technologies. I do not know what quality-of-service issues CLECs would face in providing wireless or satellite advanced services.

Ubiquity.

1. Self-provisioning. Self-provisioning would allow the CLEC to determine exactly where it wants to deploy facilities to provide advanced services. In light of their apparent business models, most CLECs are likely to care less about ubiquity and more about being able to target population centers and business centers. The Broadband Service would offer instant ubiquity (at least the same ubiquity that every other CLEC has access to) if the CLEC wanted to use it either as a primary means of providing service or as a way to supplement its self-provisioned service when it expands into new territory.

2. DSLAM Collocation. The CLECs will likely argue that DSLAM collocation does not allow ubiquitous service because of space limitations in Ameritech Illinois' offices. SBC's ILECs committed in the Pronto Waiver Order, however, to take proactive steps to minimize cases where DSLAM collocation would be unavailable. Moreover, mandatory "unbundling" of Pronto DSL facilities would lead to its own ubiquity problems, which would be beyond Ameritech Illinois' control and could be far more severe. I am referring specifically to the fact that a CLEC that leases one or more Permanent Virtual Paths (PVPs) as UNEs would

immediately monopolize from one-third to all of the DSL capacity in any given remote terminal, as well as the other stranded capacity impacts discussed by Mr. Keown and Mr. Boyer. By leasing PVPs, just a few CLECs could quickly make several remote terminals "off limits" to other CLECs and prevent those other CLECs form serving that area covered by that terminal. By contrast, allowing CLECs to use the wholesale Broadband Service rather than "unbundled" PVPs would avoid limitations on ubiquitous service by allowing Ameritech Illinois ensure all CLECs get the most efficient use of the Pronto DSL equipment and thus maximizing its capacity for serving all customers.

3. Other Technologies. Wireless and satellite services offer good ubiquity of service, aside from sight-line problems that arise in some cases. Sprint, for example, claims that its facility on top of the Sears Tower lets its wireless advanced service reach 95% of residences within 33 miles. Similarly, providing satellite service is like using a wireless tower that reaches miles into the sky and thus allows multi-state or nationwide coverage footprint.

Impact on Network Operations.

1. Self-provisioning. Mr. Hamilton discusses the impact on Ameritech Illinois' network operations of an "unbundling" requirement for Pronto DSL facilities. Those adverse impacts could be avoided if CLECs relied on self-provisioning or used the wholesale Broadband Service.

2. DSLAM Collocation. DSLAM collocation, under current rules and limitations, would not appear to have significant adverse impacts on Ameritech Illinois' network operations.

3. Other Technologies. Use of wireless or satellite technologies by CLECs should not affect Ameritech Illinois' network operations.

Q. QUESTION 1(C) SAYS: PLEASE COMMENT ON EACH OF THE FACTORS LISTED IN SECTION 51.317(b)(3) [OF FCC RULE 317].

A. I will comment on these factors individually, but once again I am speaking as a non-lawyer; Ameritech Illinois' attorneys will certainly apply the evidence to these factors in the post-hearing briefs.

Promoting the rapid introduction of competition. The Pronto "unbundling" requirements would not promote the rapid introduction of competition nearly as well as the wholesale Broadband Service. That option provides all the price benefits of unbundling without the additional responsibilities on the ILEC and on the CLEC to connect and manage its own equipment. "Unbundling," by contrast, would both delay competition and the widespread availability of advanced services (by making it uneconomic for Ameritech Illinois to deploy the Pronto DSL facilities) and, even if those facilities were deployed, would create such operational difficulties as to slow down competition and the availability of advanced services to new customers.

~~***Promoting facilities-based competition, investment, and innovation.*** I discussed above why Pronto "unbundling" would not promote competition, and the reasons why it would discourage investment and innovation are set forth earlier in the testimony of Mr. Ross Ireland and others. An "unbundling" requirement would merely perpetuate the asymmetric regulation that already exists between DSL and other advance service technologies, thereby removing competitive pressure on cable modem service providers to invest and innovate.~~

Promoting reduced regulation. The Pronto "unbundling" requirements obviously would not lead to reduced regulation, as they nearly double the prior list of all UNEs. Promoting reduced regulation is especially important in the emerging advanced services marketplace,

and applying inapposite labels like "unbundling" and "collocation" to equipment about to be deployed for that market is more pro-regulatory than pro-competition.

Providing certainty regarding the availability of an element. I am not sure that "unbundling" Pronto DSL equipment would lead to more certainty, as the FCC continues to examine these very same issues and could reach an opposite conclusion the day after this Commission issues a decision. There also would be the practical problem that the pieces of the Pronto DSL network all need one another to function, and the "unbundling" of any one piece might therefore affect when and where other alleged "UNEs" were available.

Is the proposed requirement administratively practical to apply? No. As Ameritech Illinois' other witnesses make clear, "unbundling" Project Pronto leads to many novel and complex technical questions that the Commission may ultimately have to resolve, and the technology is evolving all the time.

Q. PLEASE COMMENT ON THE APPROPRIATENESS OF THE NGDLC UNES THAT WERE PREVIOUSLY DEFINED IN DOCKET NO. 00-393. (QUESTION #2)

A. As outlined above, none of the new UNEs ordered in Docket 00-393 are appropriate. I specifically address each new UNE as ordered by the Commission in Sections VI – X of my testimony. As explained, there are numerous technical feasibility and capacity issues resulting from the establishment of such new UNEs that make these elements inappropriate from a technical perspective. Further, because a majority of the Project Pronto network architecture involves packet switching it is inappropriate from a policy perspective to order the establishment of such new UNEs. As explained in Section VI of my testimony Ameritech Illinois network, under its proposed Project Pronto deployment, would not meet

the narrow set of circumstances under which Ameritech Illinois would be obligated to provide CLECs with access to unbundled packet switching.

Q. PLEASE COMMENT ON THE UNEs THAT SHOULD BE REQUIRED, INCLUDING A DISCUSSION ON WHETHER THE BROADBAND OFFERING COULD QUALIFY AS A UNE. (QUESTION #2)

A. As stated in Section VI of my testimony, the Project Pronto network architecture should not be unbundled as a general matter for at least three reasons: (1) the Project Pronto network architecture cannot be unbundled technically because of the manner in which the components of the architecture interconnect and interwork with one another, (2) the Project Pronto network architecture involves the use of packet switching, which as stated previously, Ameritech Illinois network does not met the narrow set of requirements under which packet switching should be unbundled, and (3) CLECs have not satisfied the impair standard under which the unbundling of the Project Pronto architecture could be required.

Some portions of the Project Pronto architecture are already available to CLECs as UNEs – most notably copper sub-loops accessible from the SAI to the NID. These UNEs are mandated by the FCC UNE Remand Order. However, beyond the copper facilities the Project Pronto network (from the NGDLC equipment through the OCD) involves packet switching components that cannot be physically separated and offered as individual stand-alone elements.

Strictly from a technical perspective, taking the packet switching and impairment issues out of the equation, of these elements the only technically feasible arrangement that Ameritech Illinois could provide to CLECs would be the end-to-end Broadband Service offering.

Q. PLEASE PROVIDE A DETAILED ANALYSIS ON THE FOUR CRITERIA FOR UNBUNDLED PACKET SWITCHING. (QUESTION #3A)

A. Section VI of my testimony specifically references the four criteria established by the FCC under which Ameritech Illinois may be required to offer CLECs access to unbundled packet switching and further addresses how such criteria are not met with Ameritech Illinois' proposed Project Pronto deployment.

Q. IS IT A TRUE STATEMENT THAT WHEREVER NGDLC IS DEPLOYED, NO COPPER IN THAT AREA CAN SUPPORT DSL SERVICES? (QUESTION #3Aii)

A. No. Generally, ADSL service cannot be provided beyond a distance approximately 18 kft from a DSLAM. However, other forms of xDSL, such as IDSL may be utilized to provide a high bandwidth DSL service to customers beyond the traditional 18 kft barrier. However, IDSL is limited to 144 Kbps and as such does not provide the quality and speed of service as a standard ADSL service enabled by Project Pronto.

Additionally, Ameritech Illinois planned Project Pronto deployment would not only involve the placement of RTs at the 18 kft barrier – but would also involve the placement of RTs to end users residing between 12-18 kft from a serving wire center. The overall goal of the Project Pronto deployment is that where deployed, the copper portion of end users loops (whether measured from the central office or from the RT site) will be no greater than 12 kft in length. Thus, some RTs will be placed in location from 12-18 kft to effectively shorten those loops to 12 kft in length as well as locations beyond the 18 kft barrier. In those locations between 12-18 kft, traditional forms of xDSL could be provided using standard CO based DSLAMs. Further, because the Project Pronto deployment is an overlay network, in locations 12-18 kft from a wire center where Project Pronto is deployed, those copper facilities will remain available for a CLECs use after the placement of the Pronto RT sites.

Q. QUESTION 5 SAYS: *D.C. COURT DECISION:* PLEASE COMMENT ON THE IMPACT, IF ANY, THE D.C. COURT DECISION IN THE ASCENT CASE[32] HAS ON THE FCC *PROJECT PRONTO WAIVER ORDER* AND ASSOCIATED COMMITMENTS. WILL AMERITECH-ILLINOIS CONTINUE TO PROVIDE ADVANCED SERVICES VIA AN ADVANCED SERVICES AFFILIATE?

A. It is my understanding that the ASCENT case found that one aspect of the FCC's SBC/Ameritech Merger Conditions was invalid. Under the terms of the Merger Conditions, this court decision creates the possibility for SBC/Ameritech to decide to operate under a set of (non-structural safeguards rather than the structural separation requirements specified in the Merger Condition. SBC has been studying the complex issues associated with whether to continue under the present separate subsidiary arrangement or to operate under non-structural safeguards as to the timing or degree of integration, or even whether to integrate at all. One of our key factors in this ongoing assessment is to determine how the quality of the customer's DSL experience is affected by the present structure, as well as the interests of our shareholders. SBC has not yet made its final decision. The earliest that the advanced services affiliate(s) could become an office or division of the ILEC(s) is January 9, 2002.

As far as the Project Pronto Order, its terms provide that:

> "These provisions apply in the context of Advanced Services and will remain in effect so long as SBC/Ameritech is required to provide Advanced Services through a separate Advanced Services affiliate in the relevant state under Paragraph 12 of the SBC-Ameritech Merger Conditions."

Q. CAN AND/OR SHOULD THE COMMISSION TREAT ADLU CARDS AS PART OF THE LOOP FOR UNBUNDLING PURPOSES? (QUESTION #6A)

A. No. As explained in the UNE Remand Order, the FCC defines a local loop as a "transmission facility between a distribution frame (or its equivalent) in an incumbent LEC central office and the loop demarcation point at an end user customer premise, including inside wire owned

[32] U.S. Court of Appeals For the District of Columbia Circuit; No. 99-1441; Association of

by the incumbent LEC."[33] The definition also includes "all features, functions, and capabilities" of the loop, including "attached electronics." However, the FCC expressly excepted attached electronics "used in the provision of Advanced Services" from its definition of the local loop.[34] Furthermore, the FCC Project Pronto order found that the ADLU card was in fact the functional equivalent to Advanced Services equipment in the FCC Project Pronto order.[35]

As defined by the FCC, the local loop originates at a distribution frame, ordinarily the Main Distribution Frame (MDF) at the serving central office. In fact, in an order issued just one month after the UNE Remand Order, the FCC found that "all telecommunications services using the local loop are connected, directly or indirectly to the MDF."[36] The basis of this definition is that access to the line side of the local switch is typically provided at the Main Distribution Frame. The line side of the local switch typically refers to the individual end user copper facility, that when cross-connected to a local switch port provides a telecommunications service. Thus, the MDF provides access to each individual line.

However, an xDSL service as provisioned over the Project Pronto architecture is fundamentally different; there is no distribution frame that provides access to an individual line. As stated previously, the CLECs point of access to the Project Pronto network architecture is via the OCD. As outlined in Section III of my testimony the OCD serves to

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Communications Enterprises v. Federal Communications Commission, et al. Decided January 9, 2001.

[33] 47 C.F.R. § 51.319(a)(1); see Third Report and Order and Fourth Notice of Proposed Rulemaking, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, 15 FCC Rcd 3696 (1999) ("*UNE Remand Order*").

[34] 47 C.F.R. § 51.319(a)(1) (emphasis added).

[35] FCC 00-336, para. 14.

[36] Third Report and Order in CC Docket No. 98-147, Fourth Report and Order in CC Docket No. 96-98, Deployment of Wireline Services Offering Advanced Telecommunications Capability, 14 FCC Rcd 20912, ¶ 65 (1999).

route and aggregate traffic from each RT site to an individual CLEC's leased port on the OCD. This is provided at either a DS3 or an OC-3c level. With this architecture, a single end user line cannot be accessed at the OCD port. Therefore, the Project Pronto architecture does not provide a individual local loop facility between a single end user and a distribution frame. The "packetized" representation of these individual end user's DSL services exist within the OC-3c transport facility and the OCD only as virtual circuits, to which there is no physical, individual access.

Q. COMMISSIONER SQUIRES ALSO MENTIONS AS PART OF THIS QUESTION THAT "WITHIN ITS UNE COST STUDIES, AMERITECH INCLUDES THE COST OF LINE CARDS AS AN INPUT TO THE UNE LOOP, IDENTICAL TO HOW IT TREATS FIBER AND DISTRIBUTION CABLE." IS THIS CORRECT AND HOW IS THE PROJECT PRONTO NETWORK ARCHITECTURE DIFFERENT FROM THIS SITUATION?

A. While this may be the case in relation to traditional forms of DLC for the provision of voice service, the specific line cards at issue in this proceeding are the ADLU card and/or xDSL capable line cards placed within the ATM portion of an NGDLC system. As addressed in Section VI of my testimony, these line cards in conjunction with the entire NGDLC system provide the functional equivalent to a DSLAM and as noted below attached electronics (such as DSLAMs) were precluded from the definition of a loop in the FCC UNE Remand order.

Q. AS STATED IN COMMISSIONER SQUIRES'S QUESTION, 47 C.F.R. SECTION 51.319 PROVIDES FOR AN EXCEPTION TO ATTACHED ELECTRONICS FOR THOSE ELECTRONICS USED FOR THE PROVISION OF ADVANCED SERVICES, SUCH AS DIGITAL SUBSCRIBER LINE ACCESS MULTIPLEXERS. DOES THE ADLU CARD QUALIFY FOR THIS EXCEPTION? (QUESTION #6C)

A. Yes. As stated in Section VI of my testimony, in its Project Pronto Order, the FCC found that the Project Pronto NGDLC RT and the ADLU card is functionally equivalent to a DSLAM, and that the Project Pronto OCD is ATM switching equipment. Further, the FCC found in its UNE Remand Order that this type of equipment is packet switching equipment.

Q. DESCRIBE IN DETAIL EVERY TECHNICALLY FEASIBLE POINT OF INTERCONNECTION OR ACCESS TO SUB-COMPONENTS WITHIN THE NGDLC AMERITECH ILLINOIS IS DEPLOYING? (QUESTION #8A)

A. Given Ameritech Illinois planned NGDLC deployment, there would not be any points of interconnection and/or access to the sub-components of the NGDLC system within an RT site. As mentioned in Section VI of my testimony, due to the interconnection and interworking of the piece parts of the system it is not technically feasible and/or practical to provide CLECs physical access and/or interconnection to the sub-components of the NGDLC system. Further, as addressed in Section VII of my testimony sub-loops are not generally accessible within RT sites. As outlined in Section III of my testimony and in several attachments illustrating Ameritech Illinois planned NGDLC architecture, the copper facilities are spliced directly to the backplane of the NGDLC system, which then converts the data traffic into a packets for transport over a packet switched network consisting of the NGDLC RT and the OCD in the serving wire center. Neither of these two devices could be used in the absence of the other portions of the packet switched network.

Q. ARE THERE ANY TECHNICALLY FEASIBLE POINTS OF ACCESS TO THE PROJECT PRONTO ARCHITECTURE OUTSIDE OF THE NGDLC?

A. Yes. As mentioned, the OCD device provides CLECs the ability to access the end-to-end ADSL service provisioned over this architecture. Also, for CLECs wishing to access sub-loops (whether copper and/or optical) and/or dark fiber from their physical equipment (e.g. DSLAMs or other equipment whether collocated or placed in a CLEC structure), CLECs have the capability to access such sub-loops at the SAI and/or by requesting that SBC construct the Engineering Controlled Splice ("ECS") as outlined in the direct testimony of Mr. Mark A. Welch.

Q. IS IT TECHNICALLY FEASIBLE TO CROSS-CONNECT FROM THE CENTRAL OFFICE FIBER DISTRIBUTION FRAME TO A CLEC COLLOCATED ATM SWITCH, THEREBY ALLOWING A CLEC TO BYPASS THE AMERITECH ILLINOIS OWNED OCD PORT?

A. Not with Ameritech Illinois' planned NGDLC deployment. As is outlined in Section III of my testimony outlining the overall NGDLC architecture, each NGDLC RT system utilizes one packet based OC-3c fiber transport facility from the RT site to the OCD in the serving wire center. Within this OC-3c facility all end user services (for all ADSL providers) are transported as Permanent Virtual Circuits ("PVCs"). The OCD device is the necessary electronics within the central office to route and aggregate the incoming packets from each end user to the provider of their service. Therefore, a CLEC could not gain access to its traffic provisioned over the NGDLC system without an OCD port.

It is, as a general matter, technically feasible to cross-connect a fiber optic facility from the Fiber Distribution Frame ("FDF") to a CLEC-collocated ATM switch. The problem with providing this function with the NGDLC architecture is that there is only one OC-3c deployed for data traffic per RT site and this facility is a shared facility. Thus, if this fiber were terminated to a CLEC collocation arrangement it would make it technically impossible to provide any other service providers access to that particular NGDLC RT. In effect this would allow one service provider to monopolize all traffic from a given NGDLC site and adversely impact competition to that serving area.

However, that does not preclude a CLEC from deploying their own Project Pronto-like architecture and terminating their own "dark fiber" or other optical facilities from the FDF directly to their collocation arrangement. For example, as mentioned previously in my testimony, a CLEC could place their own DSLAM in the loop portion of the network (either collocated at an Ameritech Illinois RT site where space is available or through construction

of a CLEC owned location) and obtain access to dark fiber and/or optical sub-loops where available for transport from the DSLAM location to the CLECs ATM switch within their collocation in a serving wire center.

Q. ARE THERE ANY OTHER TECHNICALLY FEASIBLE WAYS TO BYPASS THE ILEC PACKET SWITCHING FUNCTION?

A. There is no technically feasible means to bypass the ILEC packet switching function when a CLEC utilizes ADLU cards placed within the NGDLC architecture. As mentioned the ADLU cards are placed in the ATM (packet switched) portion of the Litespan system. Thus, there is no means to use the integrated end-to-end NGDLC architecture to provide DSL service lacking the packet switched portion of the Litespan system.

It is possible to utilize the non-packet switched portion of the Litespan system to provide transport from the RT site to the serving wire center. To explain, the Time Division Multiplexed ("TDM") portion of the Litespan 2000 system does provide the capability for Ameritech Illinois to provide a DS1 transport facility from the RT site to the serving wire center.

In such instance as a CLEC collocated their own physical equipment (e.g. DSLAM) in the loop portion of the network it is technically possible for Ameritech Illinois to provide the CLEC a DS1 from this portion of the Litespan to provide transport from the RT site to the serving wire center. This is done by placing a DS1 card (or HDSL card) in one of the voice channel banks in the Litespan system. However, this function would not be performed in the ATM (packet switched) portion of the Litespan system. Additionally, this DS1 would be considered nothing more than a high capacity sub-loop that is already provided to CLECs today by Ameritech Illinois. As mentioned above, the Project Pronto deployment does not preclude a CLEC from placing their own DSLAM in the field and obtaining access dedicated

to optical sub-loops (such as the DS1 provisioned over the TDM portion of the Litespan) and/or dark fiber for transport from this location to that CLEC's central office collocation arrangement.

How a CLEC may obtain access to these facilities is further addressed in the Direct Testimony of Mark A. Welch.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY ON REHEARING?

A. Yes.